WADE-8011
WADE-8012

Mini-ITX Board

User's Manual

Version 1.4

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How to Use This Manual

How to Use This Manual

The manual describes how to configure your WADE-8011/WADE-8012 system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1: System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2: Hardware Configuration. Show the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4: BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5: Troubleshooting. Provide various of useful tips to quickly get WADE-8011/WADE-8012 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Chapter 1
System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Embedded and Communications Alliance (Intel ECA), announced today the Portwell WADE-8011/WADE-8012 adopting the Mini-ITX form factor. The WADE-8011/WADE-8012 of the Intel platform will provide high performance and flexibility for functional expansion, such as Gaming, Kiosk, DS, Medical, Defense, Industrial automation and control applications.

Sandy Bridge is the next major architecture from Intel. The WADE-8011 /WADE-8012 supports the latest Intel® Sandy Bridge processors in LGA1155 package which has memory and PCI Express controller integrated to support 2-channel DDR3 memory and PCI Express 2.0 lanes providing great graphics performance. Intel® Sandy Bridge processor is one of the most powerful and energy efficient CPU in the world.
Portwell have taken advantage of such technology to furnish a series of products that can meet multiple industrial requirements such as cost-effective of CPU performance or industrial systems.

The Intel® C206/Q67 Express Chipset continue to push innovation with an architecture designed to deliver quality, performance, and industry-leading I/O technologies on platforms powered by the Intel® Dual Core/Quad Core processor.WADE-8011/WADE-8012 is based on the Intel Sandy Bridge processor and Intel® C206/Q67 chipset. The Intel C/206/Q67 Express Chipset, when combined with a processor from the Intel® Dual Core/Quad Core processor family, delivers smart security, cost saving manageability, and intelligent performance for business platforms. WADE-8011/WADE-8012 is the first Portwell off-the-shelf product for by Intel® C206/Q67 Express Chipset, it can be an embedded solution and a good platform for customer to integrate it to the embedded system.

WADE-8011/WADE-8012 showcased one of Portwell upcoming motherboard for the Intel's Sandy Bridge processors . The WADE-8011/WADE-8012 is based on the forthcoming Intel C206/Q67 chipset and supports the new LGA 1155 socket(socket that will be used by Sandy Bridge processors). This board has lots of features, including supports next-generation SATA hard drives based on the new SATA 6Gb/s storage specification. configurations for six SATA (two SATA 6.0Gbps and four 3.0 Gbps ports) connectors, allows RAID 0/1/5 and 10, supports the latest PCIe 2.0 (one PCI-Express x16 slot) devices for double speed and bandwidth which enhances system performance, two long-DIMM memory

slot for DDR3 SDRAM up to 16GB, support total 8 USB2.0 ports (4x rear IO/4x on board), VGA / HDMI / DVI-D ,and two Gigabit Ethernet.

1.2 Check List

The WADE-8011/WADE-8012 package should cover the following basic items

- ✓ One WADE-8011/WADE-8012 Mini-ITX Main Board
- ✓ One SATA Cable
- ✓ One I/O Shield bracket
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main Processor**
  -Intel® Dual Core/Quad Core LGA1155 processor
  -CPU clock bus: 1333/1066/800 MHz
- **Chipset**
  -Intel® C206 Express chipset (WADE-8011)
  -Intel® Q67 Express chipset (WADE-8012)
- **System BIOS**
  AMI BIOS
- **Main Memory**
  -Four 240-pin DDR3 DIMM socket support up to 16GB dual channel 1066/1033MHz memory
  - WADE-8011 supports ECC and Non-ECC memory
  - WADE-8012 supports Non-ECC memory
- **Expansion Interface**
  -One PCIex16
  -One PEHI slot(SDVO connector)
- **SATA Interface**
  Six SATA ports(2x SATA 6Gb/4x SATA 3Gb)
- **Serial Port**
  Support one RS232 and one RS232/422/485
- **USB Interface**
  Support Eight USB (Universal Serial Bus) ports, four on rear I/O and four on board header for internal devices

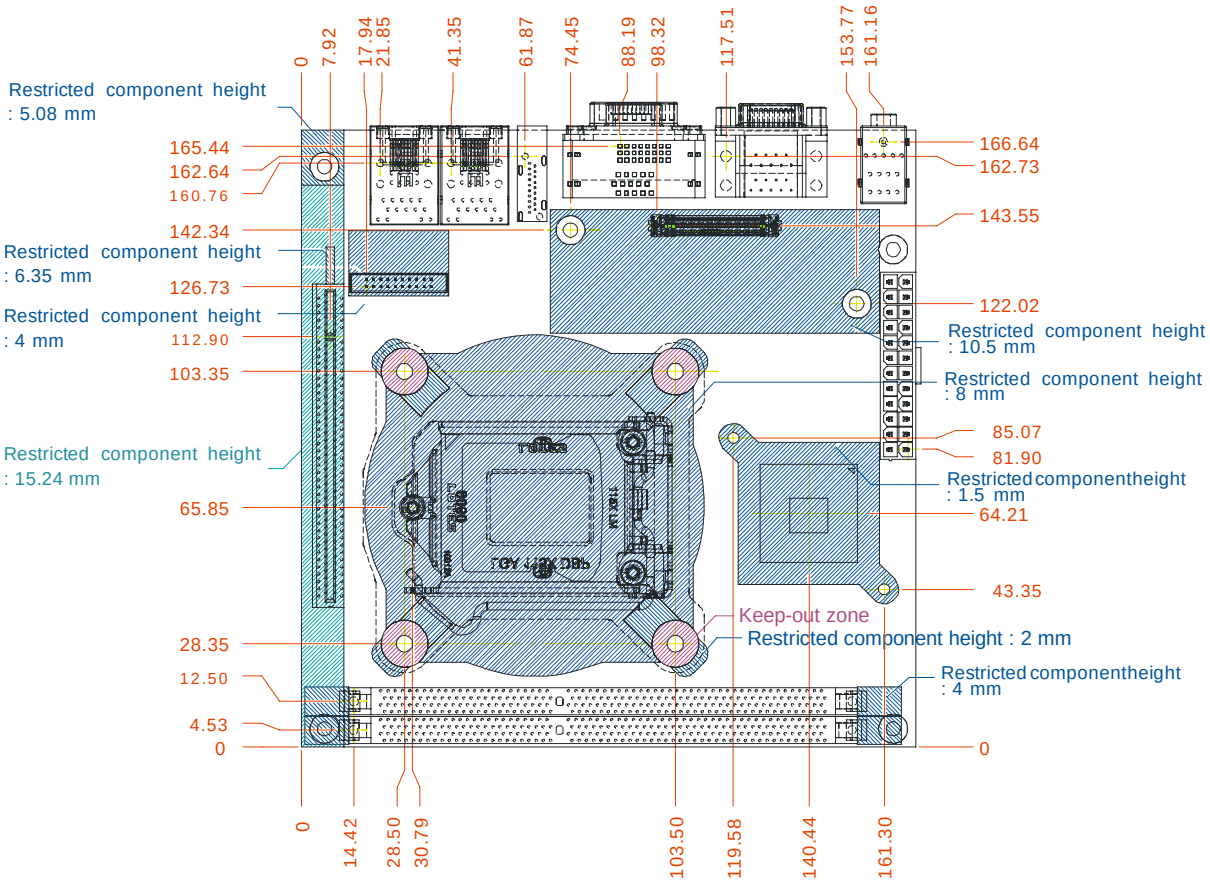
- **Audio Interface**
  Connector for Mic-In, Line-In and Line-Out
- **Real Time Clock/Calendar (RTC)**
  Support Y2K Real Time Clock/Calendar
- **Watch Dog Timer**
  -Support WDT function through software programming for enable/disable and interval setting
  -General system reset
- **On-board Ethernet LAN**
  Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports using Intel 82579LM & 82574L GbE Ethernet Controller
- **High Drive GPIO**
  One pin-header for 16 bit GPIO(8bit in & 8bit out)
- **System Monitoring Feature**
  Monitor system temperature and major power sources.
- **Outline Dimension (L x W)**
  170mm(6.69'') x 170mm(6.69'')
- **Power Requirements**
  Configuration

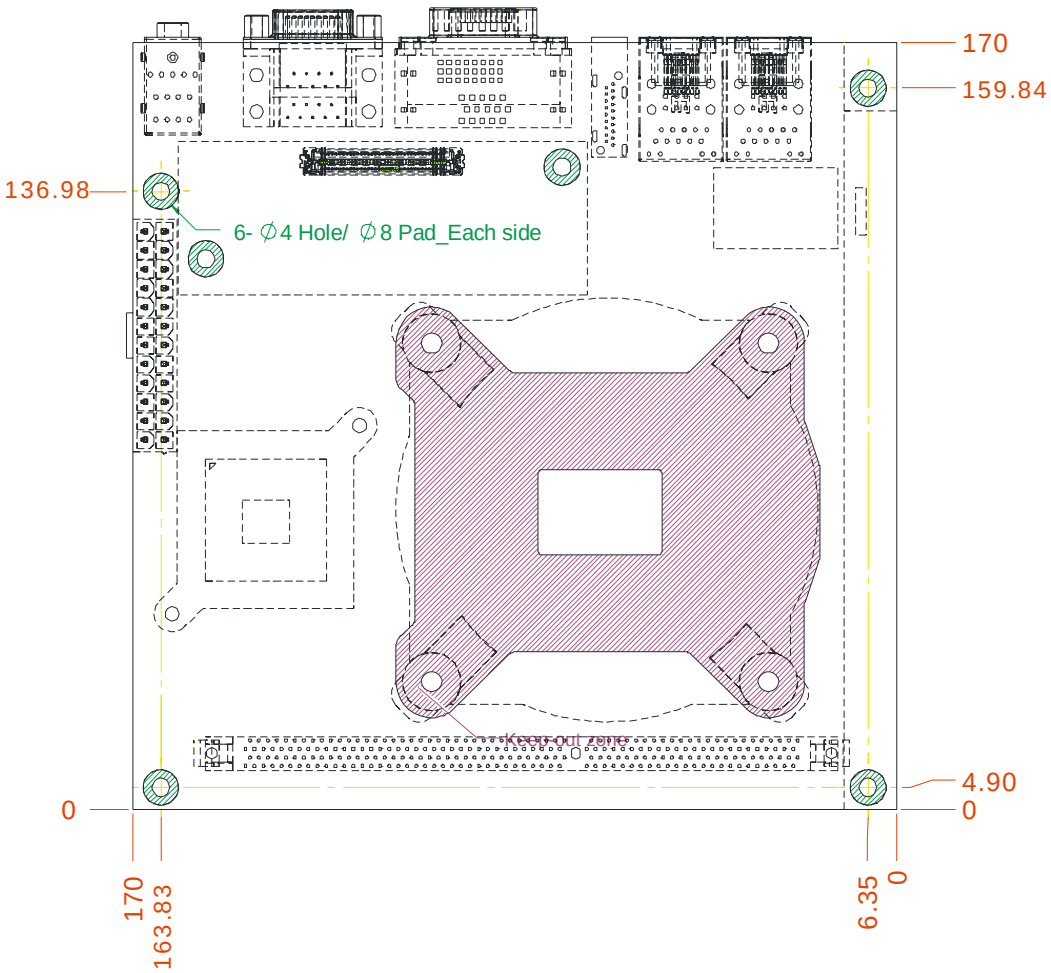
CPU Type	Intel® Core™ i5-2400 CPU 3.10GHz(ES) L3:6M
SBC BIOS	Portwell, Inc. WADE-8011/WADE-8012 BIOS Rev.: R1.00.E1
Memory	Apacer PC3-8500 2GB*1 (ELPIDA J1108BFBG-DJ-E)
VGA Card	Onboard Intel® HD Graphics Family (Sandy Bridge)
VGA Driver	Onboard Intel® HD Graphics Family Version 6.14.10.5328
LAN Card	Onboard Intel® 82574L/82579LM Gigabit Network Connection
LAN Driver	Intel® 82574L/82579LM Gigabit Network Connection Version
Audio Card	Onboard Realtek ALC662 High Definition Audio Controller
Audio Driver	Realtek ALC662 High Definition Audio Version 5.10.0.6257
Chip Driver	Intel® Chipset Device Software Version 9.2.0.1019
USB 2.0 Driver	Intel® 6 Series/C200 Series Chipset Family USB Enhanced Host Controller Version 9.2.0.1013
SATA HDD	WD WD1002FEX 1TB
CDROM	LITE-ON LH-20A1S
Power Supply	FSP400-60PFN

Item	Power ON	Full Loading	Full Loading
CPU +12V	2.51A	3.75A	3.81A
System +12V	1.79A	2.38A	2.21A
System +3.3V	0.95A	1.10A	1.15A
System +5V	1.73A	2.26A	2.30A
System+ Device +12V	4.75A	6.25A	6.31A
System+ Device +5V	2.69A	3.00A	2.95A
USB Loading Test	4.77 V/ 500 mA		

- **Operating Temperature**
  0 °C ~ 60 °C
- **Storage temperature**
  -20 ~ 80 °C
- **Relative Humidity**
  0% ~ 90%, non-condensing

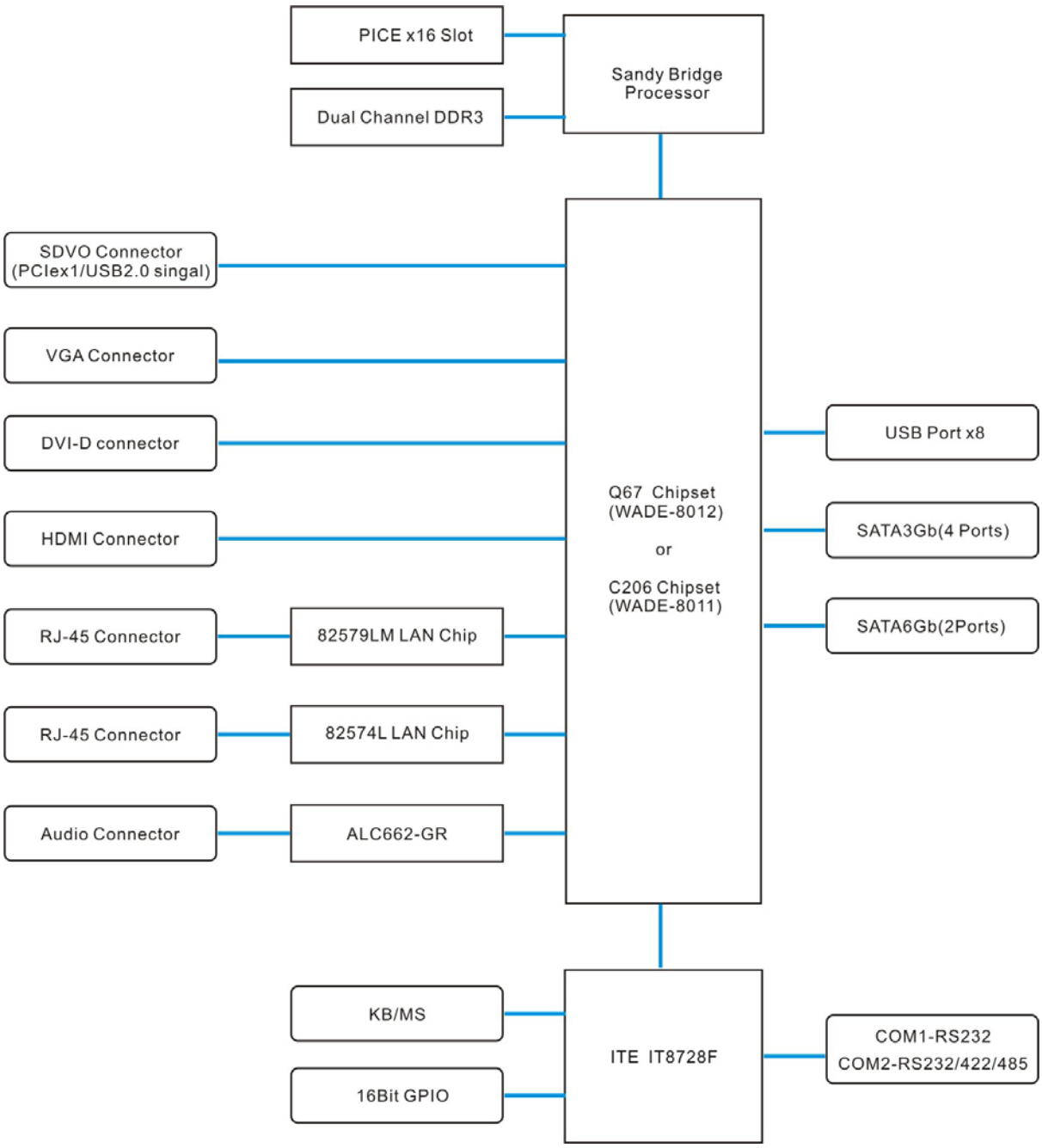
1.3.1 Mechanical Drawing




170
159.84
136.98
6- ∅4 Hole/ ∅8 Pad_Each side
Keep out zone
4.90
0
0
170
163.83
6.35
0

1.4 System Architecture

All of details operating relations are shown in WADE-8011/WADE-8012 System Block Diagram.



WADE-8011/WADE-8012 System Block Diagram

Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on WADE-8011/WADE-8012 are in the proper position. The default settings shipped from factory are marked with an asterisk (♣).

2.1 Jumper Setting

In general, jumpers on the single board computer are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for "Not Connect".

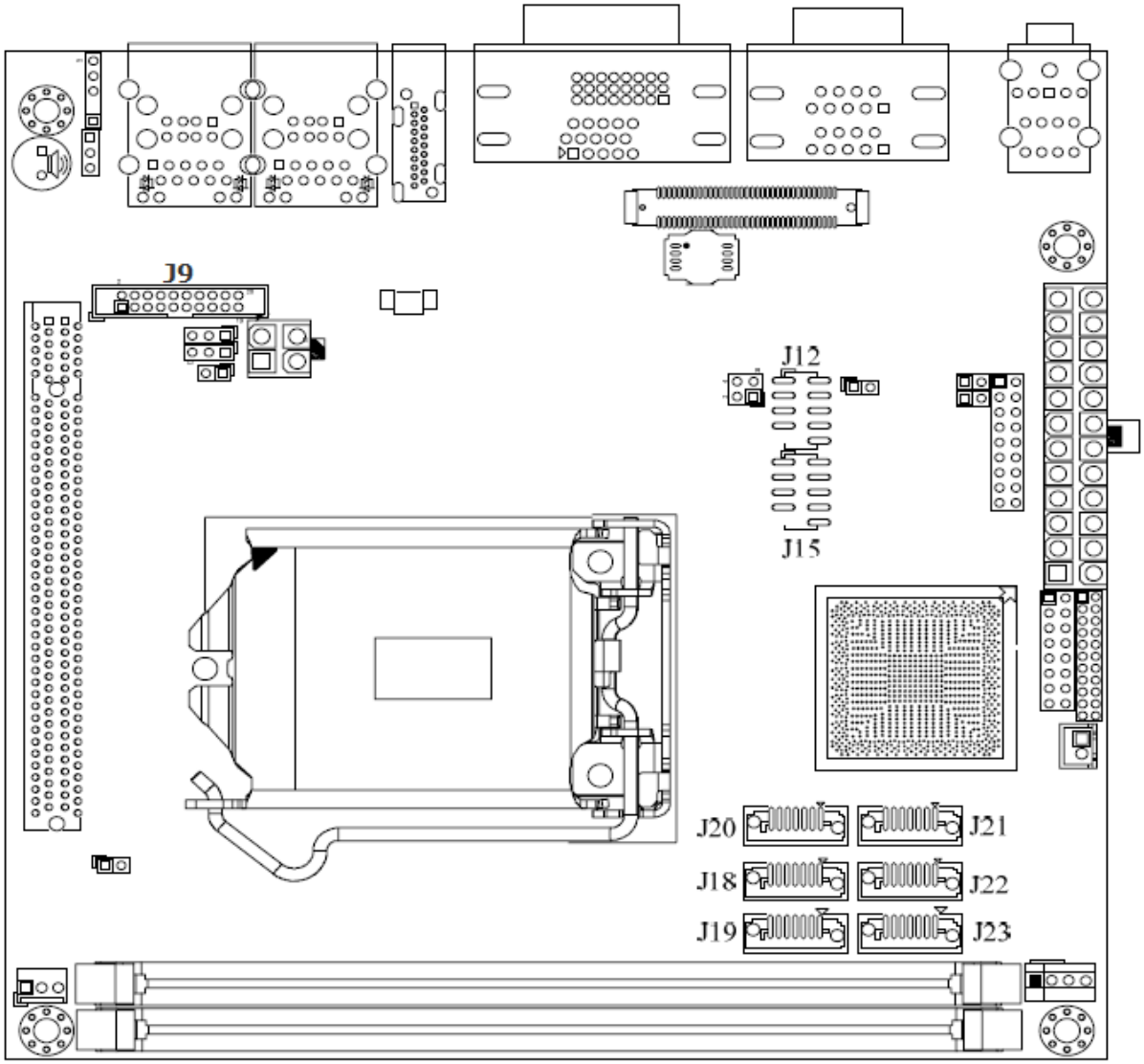
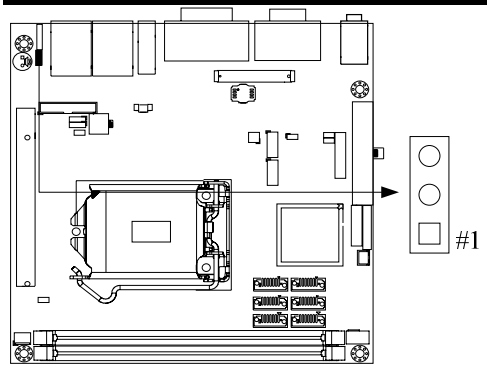


Figure 2-1 WADE-8011 / WAD-8012 Jumper and Connector Locations

The jumper settings are schematically depicted in this manual as follows:

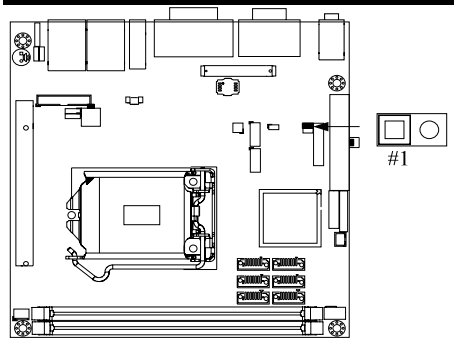
JP1: CMOS Clear

JP1	Function
1-2 Short	Normal Operation
2-3 Short	Clear CMOS Contents



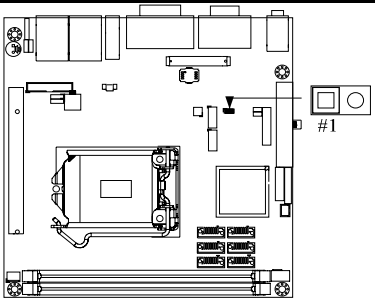
JP5: WDT Selection

JP5	Function
Short	Enable
Open	Disable★



JP6: ATX Emulation AT Mode Selection

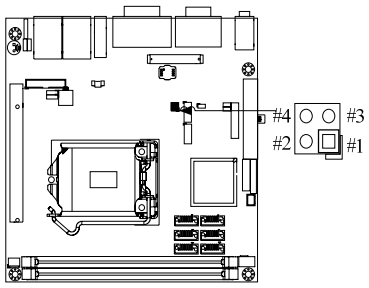
JP6	Function
Short	ATX Emulation AT Mode
Open	ATX Mode★



JP7: PCI Express Bifurcation

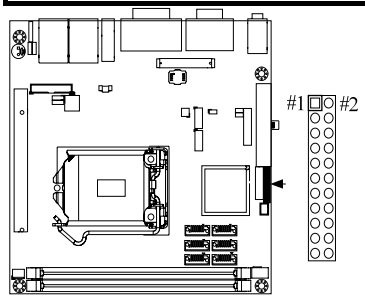
JP7	Function
(1-2)Short ,(3-4)short	1x8 , 2x4 PCI Express
(1-2)Short,(3-4)Open	2x8 PCI Express
(1-2)Open ,(3-4)Short	Reserved
(1-2)Open ,(3-4)Open	1x16 PCI Express

PCIe bifurcation support varies with the Processor and PCH SKUs used



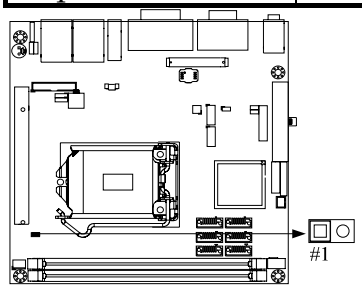
JP8: COM2 (J2B) Interface Selection

JP8	Function
5-6, 9-11, 10-12, 15-17, 16-18 Short	RS-232 ★
3-4, 7-9, 8-10, 13-15, 14-16, 21-22 Short	RS-422
1-2, 7-9, 8-10, 19-20 Short	RS-485



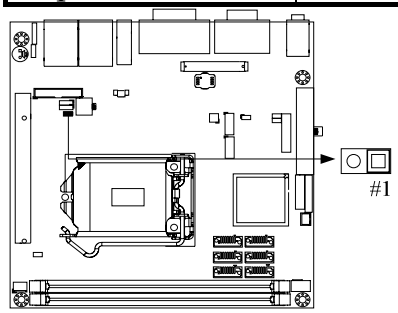
JP10: VCC_SA Voltage Selection

JP10	Function
Short	0.85V
Open	0.925V ★



JP11: ME Function Selection

JP11	Function
Short	Disable
Open	Enable ★



2.2 Connector Allocation

I/O peripheral devices and Flash disk will be connected to these interface connectors

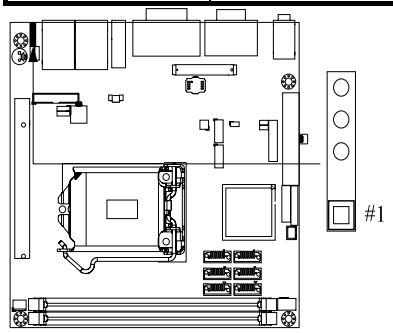
Connector Function List

Connector	Function	Remark
J1	VGA + DVI Connector	
J2	COM1 & 2 Connector	
J3	SMBUS Connector	5x1 pin header
J4	Audio Jack (Mic + Line_in + Line_out)	
J5	RJ45 + USB Connector	
J6	RJ45 + USB Connector	
J7	PCIe x 1 + USB Connector	
J9	TPM Connector	Reserved
J10	+12V Power Connector	Connect to CPU
J11	WDT LED Connector	
J12/J15	External USB Connector	
J13	ATX Power Connector	
J14	General Purpose I/O Connector	
J16	Front Panel Pin HDR	
J17	CASEOPEN#	Reserved
J18/J19/J20/J21	SATA GEN2 Connector	
J22/J23	SATA GEN3 Connector	
J24	PCIe x 16 SLOT	
J25/J28	DDR3 Socket	
J26	FAN (SYSTEN FAN) Power Connector	
J27	FAN (CPU FAN) Power Connector	
U1	HDMI Connector	
JP3	VRM I2C Debug Connector	3x1 pin header
JP4	VRM Debug/Program Connector	3x1 pin header

Pin Assignments of Connectors

SMBUS Connector (J3)

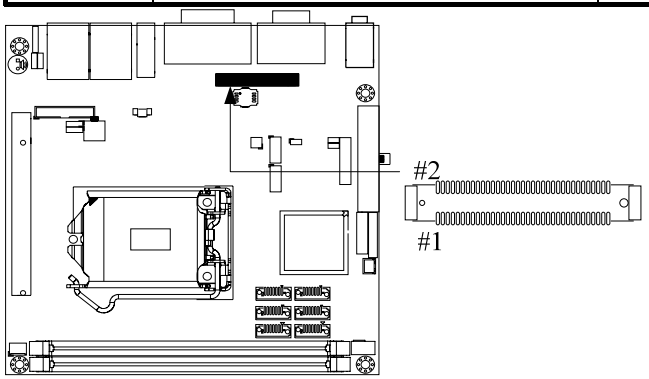
Pin No.	Function
1	SMB_CLK
2	N/C
3	Ground
4	SMB_DAT
5	+5V



PCIe x1 & USB Connector (J7)

Pin No.	Signal Description	Pin No.	Signal Description
1	+3V	2	+3VSBY
3	+3V	4	+3VSBY
5	+3V	6	+5V
7	+3V	8	+5V
9	+3V	10	+5V
11	+3V	12	+5V
13	+3V	14	+1.5V
15	Ground	16	+1.5V
17	n/c	18	+1.5V
19	n/c	20	Ground
21	Ground	22	n/c
23	n/c	24	n/c
25	Ground	26	Ground
27	n/c	28	Ground
29	n/c	30	n/c
31	Ground	32	n/c
33	Ground	34	Ground
35	n/c	36	Ground
37	n/c	38	n/c
39	Ground	40	n/c
41	Ground	42	Ground
43	n/c	44	SUSCLK
45	n/c	46	Ground
47	Ground	48	PCIE_CLK-

49	n/c	50	PCIE_CLK+
51	Ground	52	Ground
53	PCIE_WAKE#	54	Ground
55	n/c	56	Ground
57	Ground	58	Ground
59	PCIE_RX-	60	PLT_RST#
61	PCIE_RX+	62	Ground
63	Ground	64	USB_Data+
65	PCIE_TX-	66	USB_Data-
67	PCIE_TX+	68	SMB_DATA
69	PLT_RST#	70	SMB_CLK

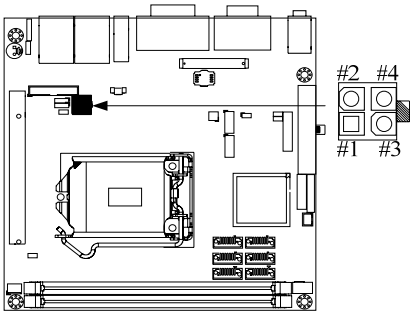


J9: TPM Pin Header

Pin No.	Signal Description	Pin No.	Signal Description
1	PCKL_TPM	2	GND
3	LFRAME#	4	X
5	SIO2_PLTRST#	6	VCC
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	SMB_CLK_MAIN	14	SMB_DATA_MAIN
15	3VSB	16	SERIRQ
17	GND		X
19	LPCPD#		X

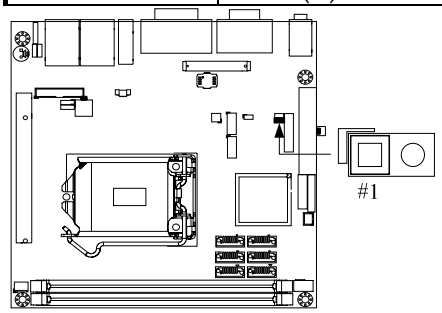
J10: +12V POWER Connector

PIN No.	Signal Description
1	Ground
2	Ground
3	+12V
4	+12V



WDT LED Connector (J11)

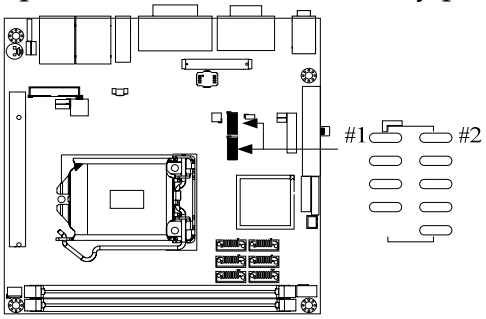
Pin No.	Signal Description
1	LED(-)
2	LED(+)



J12/J15: External USB Connector

Pin No.	Signal Description	Pin No.	Signal Description
1	5V Dual	2	5V Dual
3	USB-	4	USB-
5	USB+	6	USB+
7	Ground	8	Ground
9	Key(no pin)	10	N/C

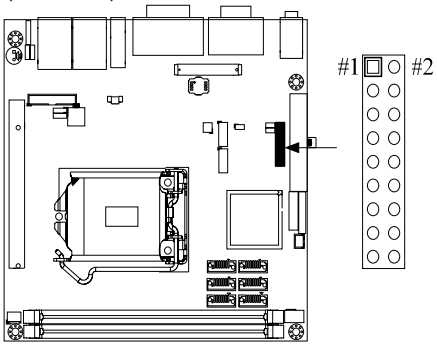
Note:
5V Dual is always available. It's supplied by either 5V VCC power source in normal operation mode or 5V standby power source in standby mode.



J14:General Purpose I/O Connector

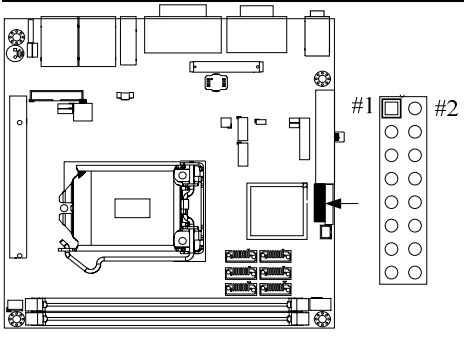
Pin No.	Signal Description	Pin No.	Signal Description
1	GPIO0	2	GPIO8
3	GPIO1	4	GPIO9
5	GPIO2	6	GPIO10
7	GPIO3	8	GPIO11
9	GPIO4	10	GPIO12
11	GPIO5	12	GPIO13
13	GPIO6	14	GPIO14
15	GPIO7	16	GPIO15
17	Ground	18	+5V

Note:
All General Purpose I/O ports can only apply to standard TTL ± 5% signal level (0V/5V), and each Fan.



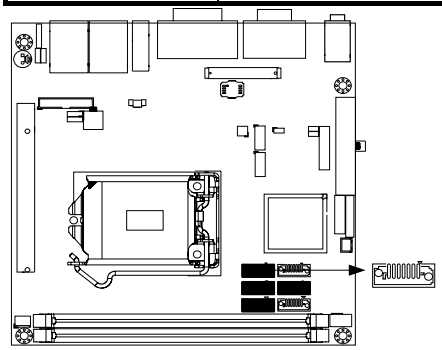
Front Panel Pin HDR(J16)

Pin No.	Signal Description	Pin No.	Signal Description
1	PWR_LED(+)	2	Speaker(+)
3	PWR_LED(-)	4	N/C
5	LAN1_ACT	6	N/C
7	LAN1_LINK	8	Speaker(-)
9	LAN2_LINK	10	Power On(-)
11	LAN2_ACT	12	Power On(+)
13	HDD_LED(+)	14	Reset (+)
15	HDD_LED(-)	16	Reset (-)



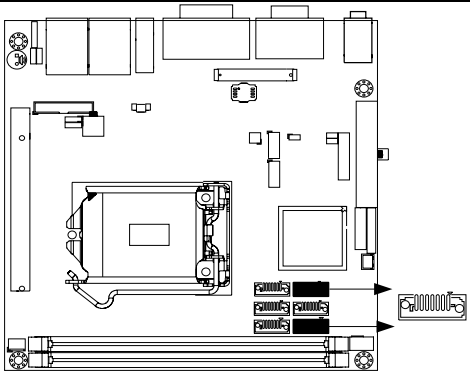
J18/J19/J20/J21: SATA GEN2 Connector

Pin No.	Signal Description
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground



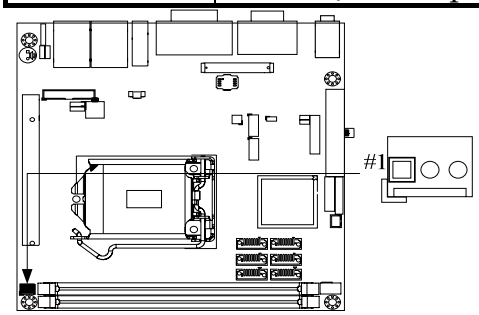
J22/J23: SATA GEN3 Connector

Pin No.	Signal Description
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground



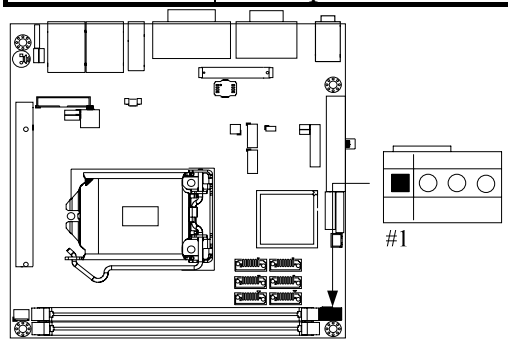
J26: System Fan Connector

Pin No.	Signal Description
1	Ground
2	Fan speed control
3	Fan on/off output



J27: CPU Fan Connector

Pin No.	Signal Description
1	Ground
2	+12V
3	Fan on/off output
4	Fan Speed control

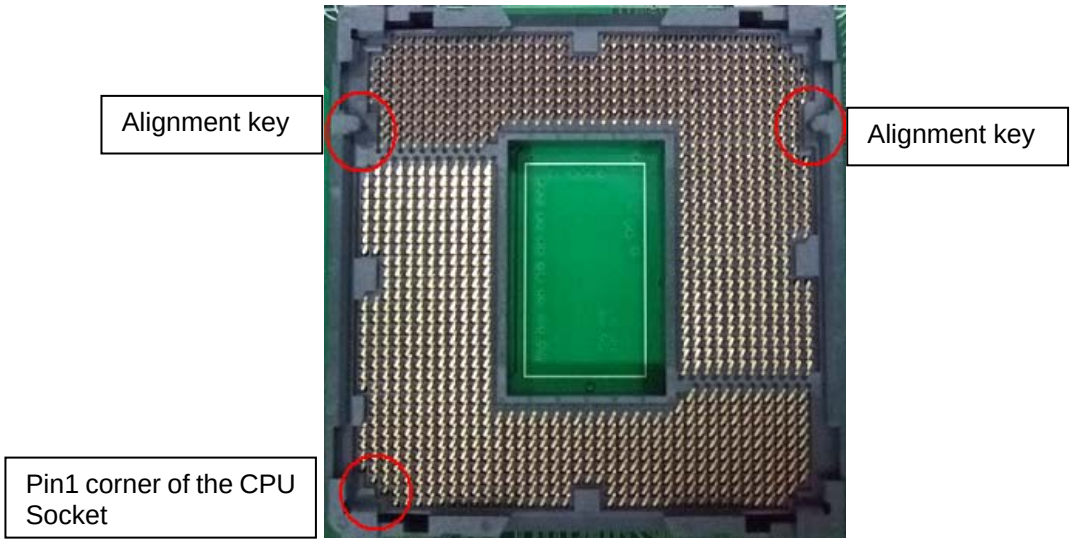


Chapter 3
System Installation

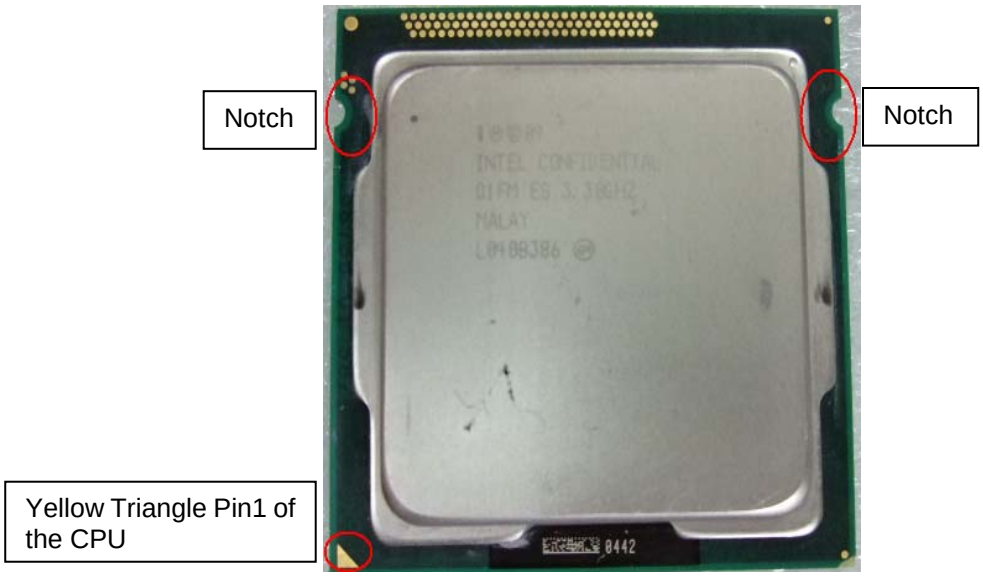
This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel LGA-1155 Processor

LGA-1155 CPU Socket



LGA-1155 CPU



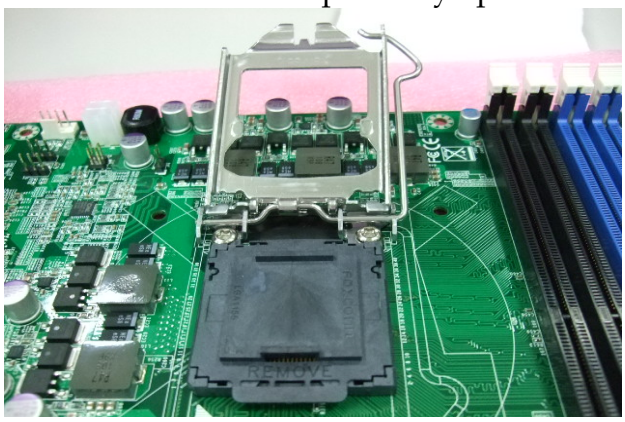
Please remember to locate the alignment keys on the CPU socket of the motherboard and the notches on the CPU.

LGA-1155 CPU Installation Steps

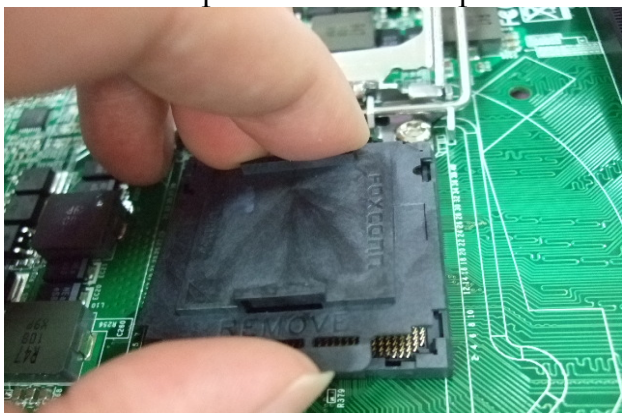
Before install the CPU, please make sure to turn off the power first!!

1. Open the load lever

2. Lft the load lever up to fully open



3. Rmove the plastic cap on the CPU socket. Before you install the CPU, always cover it to protect the socket pin



4. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Note that alignment keys are matched

5. Make sure the CPU has been seated well into the socket. If not, take out the CPU and reinstall

6. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Note that alignment keys are matched

7. Push the CPU socket lever back into its locked position

8. Please make sure four hooks are in proper position before you install the cooler

3.2 Main Memory

WADE-8011 /WADE-8012 wo 240 pin DIMM sockets which supports Dual channel 1066/1333 DDR3-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory can be up to 16GB. Memory clock and related settings can be detected by BIOS via SPD interface

For system compatibility and stability, do not use memory module without brand. Memory configuration can be set to either one double-sided DIMM in one DIMM socket or two single-sided DIMM in both sockets.

Beware of the connection and lock integrity from memory module to socket. Inserting improperly it will affect the system reliability.

Before locking, make sure that all modules have been fully inserted into the card slots.

Note:

To insure the system stability, please do not change any of DRAM parameters in BIOS setup to modify system the performance without acquired technical information.

3.3 Installing the Single Board Computer

To install your WADE-8011/WADE-8012 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position

Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8011/WADE-8012 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING
Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.4 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

WADE-8011/WADE-8012 uses Intel® Q67 Platform Controller Hub (PCH). It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows XP, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8011/WADE-88012 CD-title.

3.3.2 Intel® Integrated Graphics Controller

WADE-8011/WADE-8012 uses Intel® PCH integrated graphic chipset to gain an outstanding graphic performance. WADE-8011/WADE-8012 supports VGA, DVI-D dual display. This combination makes WADE-8011/WADE-8012 an excellent piece of multimedia hardware

Drivers Support
Please find the Graphic drivers in the WADE-8011/WADE-8012 CD-title. Drivers support, Windows XP/Win7.

3.3.3 On-board Gigabit Ethernet Controller

Drivers Support
Please find Intel 82579LM and 82574L LAN driver in /Ethernet directory of WADE-8011/WADE-8012 CD-title. The drivers support Windows XP/Win7

3.3.4 Audio Controller

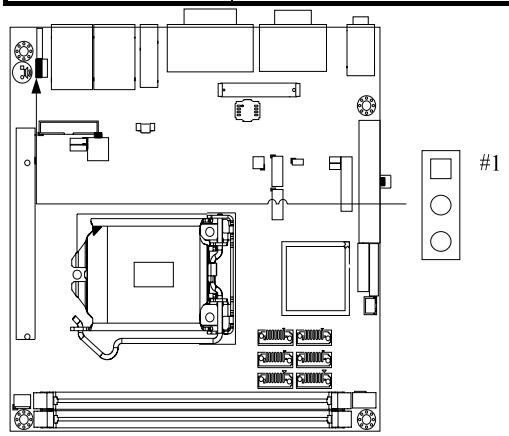
Please find Realtek ALC662-GR (High Definition Audio driver) form WADE-8011/WADE-8112 CD-title. The drivers support Windows XP/Win7.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

JP1: CMOS Clear

JP1	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents



3.5 WDT Function

The Watchdog Timer of motherboard consists of 8-bit programmable time-out counter and a control and status register.

WDT Controller Register
There are two PNP I/O port addresses that can be used to configure WDT.

2Eh: EFIR (Extended Function Index Register, for identifying CR index number)
2Fh: EFDR (Extended Function Data Register, for accessing desired CR)

WDT Control Mode Register
The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

WADE-8011/WADE-8012 allows users to control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to ITE IT8728F data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to Winbond W83627THF data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

WDT Control Command Example

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>

#define SIO_Port 0x2E
#define  SIO_Port2          0x4E
#define GPIO_LDN          0x07

void Enter_IT872x_SIO() {
```

```
        outportb(SIO_Port, 0x87);
        outportb(SIO_Port, 0x01);
        outportb(SIO_Port, 0x55);
        outportb(SIO_Port, 0x55);

}

void Set_LDN(unsigned char LDN) {
        outportb(SIO_Port, 0x07);
        outportb(SIO_Port+1, LDN);
        printf("LDN=%x\n", LDN);
}

void Set_Register(unsigned char offset, unsigned char value) {
        outportb(SIO_Port, offset);
        outportb(SIO_Port+1, value);
        printf("Write offset:%x = %x\n", offset, value);
}

int main(void) {

        printf("test string\n");
        Enter_IT872x_SIO();
        Set_LDN(GPIO_LDN);

        Set_Register(0x72, 0xC0);
        Set_Register(0x73, 0x05);
        printf("System will reset in 5 seconds\n");

        return 0;
}
```

3.6 GPIO

The motherboard provides 8 input / output ports that can be individually configured to perform a simple basic I/O function.

GPIO Pin Assignment

The WADE-8011/WADE-8012 provides 8 input/output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

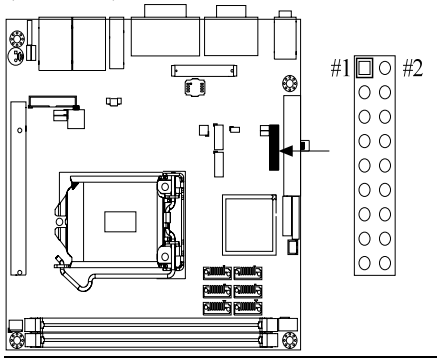
The GPIO port is located on JP14 shown as follows. Please note: **Do not short the Pin 17 and Pin 18 of the JP14!**

The control for the GPIO signals is handled through a separate 2-byte I/O space.

J14: General Purpose I/O Connector

Pin No.	Signal Description	Pin No.	Signal Description
1	GPIO0	2	GPIO8
3	GPIO1	4	GPIO9
5	GPIO2	6	GPIO10
7	GPIO3	8	GPIO11
9	GPIO4	10	GPIO12
11	GPIO5	12	GPIO13
13	GPIO6	14	GPIO14
15	GPIO7	16	GPIO15
17	Ground	18	+5V

Note:
All General Purpose I/O ports can only apply to standard TTL ± 5% signal level (0V/5V), and each Fan.



GPIO Control Command Example (C Language)

```
#include <stdio.h>
#include <conio.h>
#include <stdlib.h>

#define SIO_Port       0x2E
#define SIO_Port2      0x4E
#define GPIO_LDN       0x07
#define GPIO_Base      0x0A00

//Enter SIO
void Enter_IT872x_SIO() {
      outp(SIO_Port, 0x87);
      outp(SIO_Port, 0x01);
      outp(SIO_Port, 0x55);
      outp(SIO_Port, 0x55);
```

```
}

//Select LDN
void Set_LDN(unsigned char LDN) {
	outp(SIO_Port, 0x07);
	outp(SIO_Port+1, LDN);
	//printf("LDN=%x\n", LDN);
}

//Set register offset to Value
void Set_Register(unsigned char offset, unsigned char value) {
	outp(SIO_Port, offset);
	outp(SIO_Port+1, value);
	//printf("Write offset:%x = %x\n", offset, value);
}

//Or register
void Or_Register(unsigned char offset, unsigned char value) {
	outp(SIO_Port, offset);
	outp(SIO_Port+1, inp(SIO_Port+1) | value);
	//printf("Write offset:%x = %x\n", offset, value);
}

//And register
void And_Register(unsigned char offset, unsigned char value) {
	outp(SIO_Port, offset);
	outp(SIO_Port+1, inp(SIO_Port+1) & value);
	//printf("Write offset:%x = %x\n", offset, value);
}
int main(void) {

	int result;
	printf("WADE-8012 GPIO Test:\n");

	//pin1 =11
	//pin3 =12
	//pin5 =47
	//pin7 =50
	//pin9 =74
	//pin11=75
	//pin13=76
	//pin15=77

	//pin2 =14
	//pin4 =35
```

```
//pin6 =36
//pin8 =37
//pin10=70
//pin12=71
//pin14=72
//pin16=73

Enter_IT872x_SIO();
Set_LDN(GPIO_LDN);

//Enable GPIO
//Or_Register(0xC0,0x46)       //11,12,14
//Or_Register(0xC2,0xE0)       //35,36,37
//Or_Register(0xC3,0x80)       //47
//Or_Register(0xC4,0x01)       //50

//Set Output
Or_Register(0xC8,0x06); //11,12
Or_Register(0xCB,0x80); //47
Or_Register(0xCC,0x01); //50
Or_Register(0xCE,0xF0); //74,75,76,77

//Set Input
And_Register(0xC8,0xEF);       //14
And_Register(0xCA,0x1F);       //35,36,37
And_Register(0xCE,0xF0);       //70,71,72,73

//output high
outp(GPIO_Base+0,0x06); //11,12
outp(GPIO_Base+3,0x80); //47
outp(GPIO_Base+4,0x01); //50
outp(GPIO_Base+6,0xF0); //74,75,76,77

result=1;
if ((inp(GPIO_Base+0)&0x10)!=0x10) result=0;
if ((inp(GPIO_Base+2)&0xE0)!=0xE0) result=0;
if ((inp(GPIO_Base+6)&0x0F)!=0x0F) result=0;

if (result==0){

      printf("Test fail!!\n");

      return 1;
}
```

```
//output low
outp(GPIO_Base+0,inp(GPIO_Base+0)&0xF9);      //11,12
outp(GPIO_Base+3,inp(GPIO_Base+3)&0x7F);      //47
outp(GPIO_Base+4,inp(GPIO_Base+4)&0xFE);      //50
outp(GPIO_Base+6,inp(GPIO_Base+6)&0x0F);      //74,75,76,77

result=1;
if ((inp(GPIO_Base+0)&0x10)!=0x00) result=0;
if ((inp(GPIO_Base+2)&0xE0)!=0x00) result=0;
if ((inp(GPIO_Base+6)&0x0F)!=0x00) result=0;

if (result==0){

      printf("Test fail!!\n");
      return 1;

}

////////////////////////////////////////////////

//Set Input
And_Register(0xC8,0xF9);      //11,12
And_Register(0xCB,0x7F);      //47
And_Register(0xCC,0xFE);      //50
And_Register(0xCE,0x0F);      //74,75,76,77

//Set output
Or_Register(0xC8,0x10); //14
Or_Register(0xCA,0xE0); //35,36,37
Or_Register(0xCE,0x0F); //70,71,72,73

//output high
outp(GPIO_Base+0,0x10); //14
outp(GPIO_Base+2,0xE0); //35,36,37
outp(GPIO_Base+6,0x0F); //70,71,72,73

result=1;
if ((inp(GPIO_Base+0)&0x06)!=0x06) result=0; //11,12
if ((inp(GPIO_Base+3)&0x80)!=0x80) result=0; //47
if ((inp(GPIO_Base+4)&0x01)!=0x01) result=0; //50
if ((inp(GPIO_Base+6)&0xF0)!=0xF0) result=0; //74,75,76,77

if (result==0){

      printf("Test fail!!\n");
```

```
        return 1;
    }

    //output low
    outp(GPIO_Base+0,inp(GPIO_Base+0)&0xEF);      //14
    outp(GPIO_Base+2,inp(GPIO_Base+2)&0x1F);      //35,36,37
    outp(GPIO_Base+6,inp(GPIO_Base+6)&0xF0);      //70,71,72,73

    result=1;
    if ((inp(GPIO_Base+0)&0x06)!=0x00) result=0; //11,12
    if ((inp(GPIO_Base+3)&0x80)!=0x00) result=0; //47
    if ((inp(GPIO_Base+4)&0x01)!=0x00) result=0; //50
    if ((inp(GPIO_Base+6)&0xF0)!=0x00) result=0; //74,75,76,77

    if (result==0){

        printf("Test fail!!\n");
        return 1;

    }

    //getchar ();

    printf("Test Pass!!\n");
    return 1;
}
```

Chapter 4
BIOS Setup Information

WADE-8011/WADE-8012 uses AMI BIOS structure stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8011/WADE-8012 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up

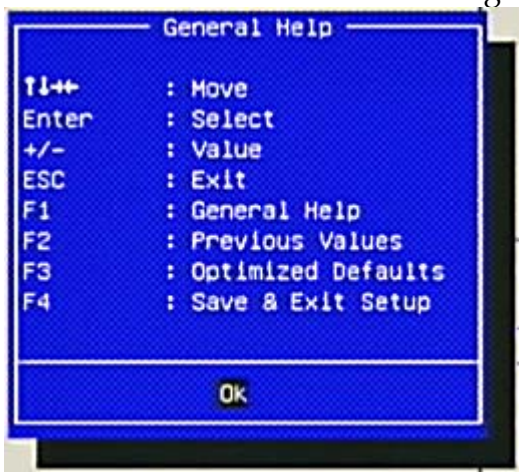
4.1 Entering Setup -- Launch System Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen.

Press <Del> or <F2> to enter SETUP

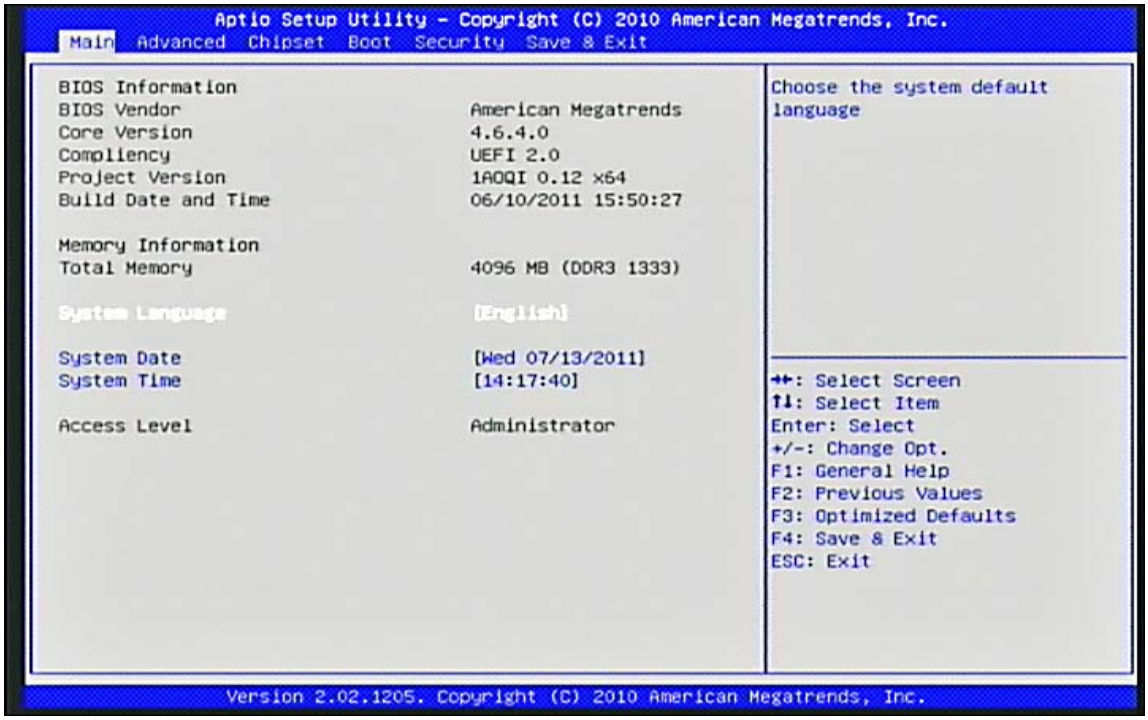
If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.



BIOS Information, Memory Information
These items show the firmware and memory specifications of your system. Read only.

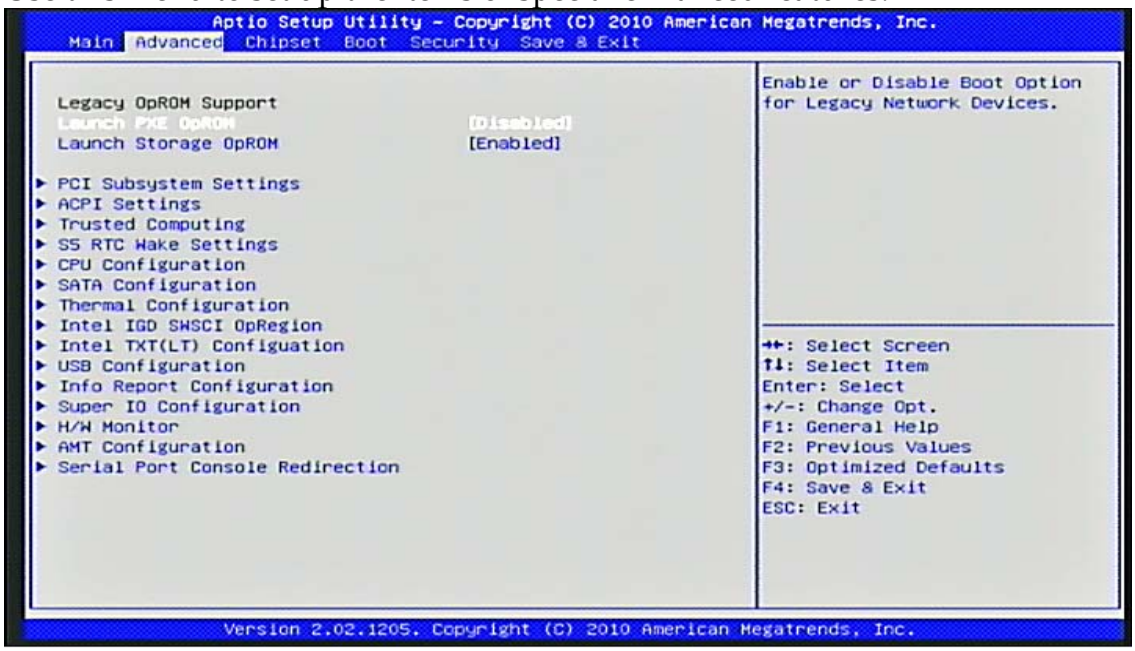
System Language
Choose the system default language.
Choices: English.

System Date
The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

System Time
The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

4.3 Advanced

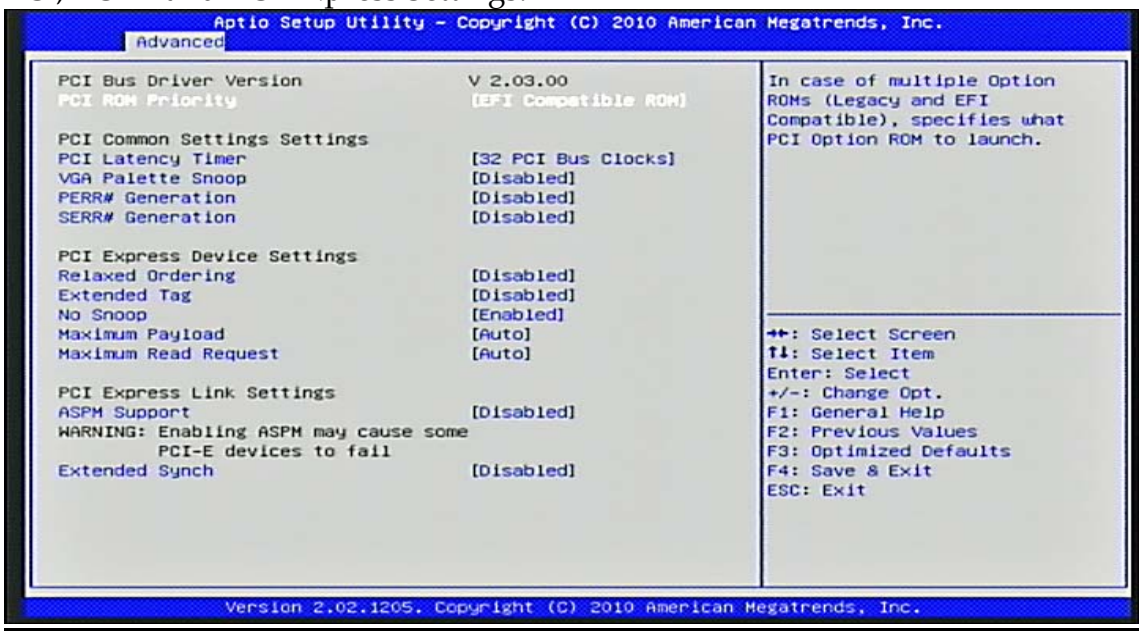
Use this menu to set up the items of special enhanced features.



Launch PXE OpROM
Enabled or Disabled Boot Option for Legacy Network Devices.
Choices: Disabled, Enabled.

Launch Storage OpROM
Enabled or Disabled Boot Option for Legacy Mass Storage devices.
Choices: Disabled, Enabled.

PCI Subsystems Settings
PCI, PCI-X and PCI Express Settings.



PCI ROM Priority
In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCO Option ROM to launch.
Choices: Legacy ROM, EFI Compatible ROM.

PCI Latency Timer
Value to be programmed into PCI Latency Timer Register.
Choices: 32 PCI Bus Clocks, 64 PCI Bus Clocks, 96 PCI Bus Clocks, 128 PCI Bus Clocks, 160 PCI Bus Clocks, 192 PCI Bus Clocks, 224 PCI Bus Clocks, 248 PCI Bus Clocks.

VGA Palette Snoop
Choices: Disabled, Enabled.

PERR# Generation
Enables or Disables PCI Device to Generate PERR#.
Choices: Disabled, Enabled.

SERR# Generation
Enables or Disables PCI Device to Generate SERR#.
Choices: Disabled, Enabled.

Relaxed Ordering
Choices: Disabled, Enabled.

Extended Tag
If Enabled allows Device to use 8-bit Tag field as a requester.
Choices: Disabled, Enabled.

No Snoop
Choices: Disabled, Enabled.

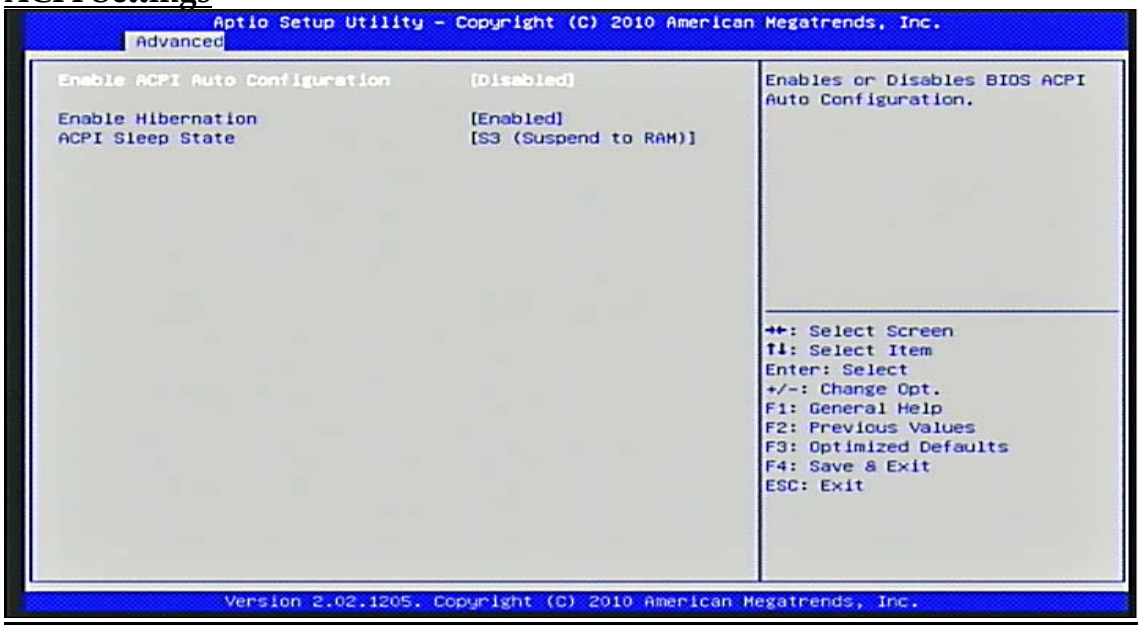
Maximum Payload
Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.
Choices: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes.

Maximum Read Request
Set Maximum Read Request size of PCI Express Device or allow System BIOS to select the value.
Choices: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes.

ASPM Support
Set the ASPM Level: Force L0 – Force all links to L0 State: AUTO – BIOS auto configure: DISABLE – Disables ASPM.
Choices: Disabled. Auto, Force L0.

Extended Synch
If Enabled allows generation of Extended Synchronization patterns.
Choices: Disabled, Enabled.

ACPI Settings



Enabled ACPI Auto Configuration
Choices: Enabled, Disabled.

Enabled Hibernation
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
Choices: Enabled, Disabled.

ACPI Sleep State
Select the highest ACPI Sleep state the system will enter when the SUSPEND button is pressed.
Choices: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM).

Trusted Computing

TPM SUPPORT

Enables or Disables TPM support. O.S. will not show TPM. Reset of platform is required.

TPM State

Turn TPM Enable or Disable.

NOTE: Your Computer will reboot during restart in order to change State of TPM.

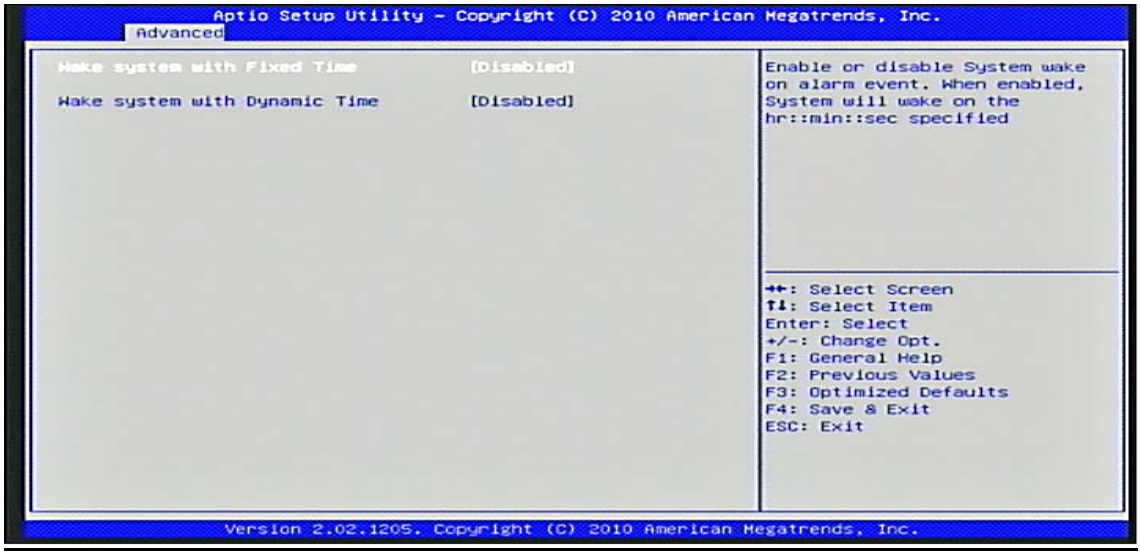
Pending TPM operation

Schedule TPM operation.

NOTE: Your Computer will reboot during restart in order to change State of TPM.

S5 RTC Wake Settings

Enabled system to wake from S5 using RTC alarm



Wake system with Fixed Time
Enabled or Disabled system wake on alarm event. When Enabled, system will wake on the hr::min::sec specified.
Choices: Disabled, Enabled

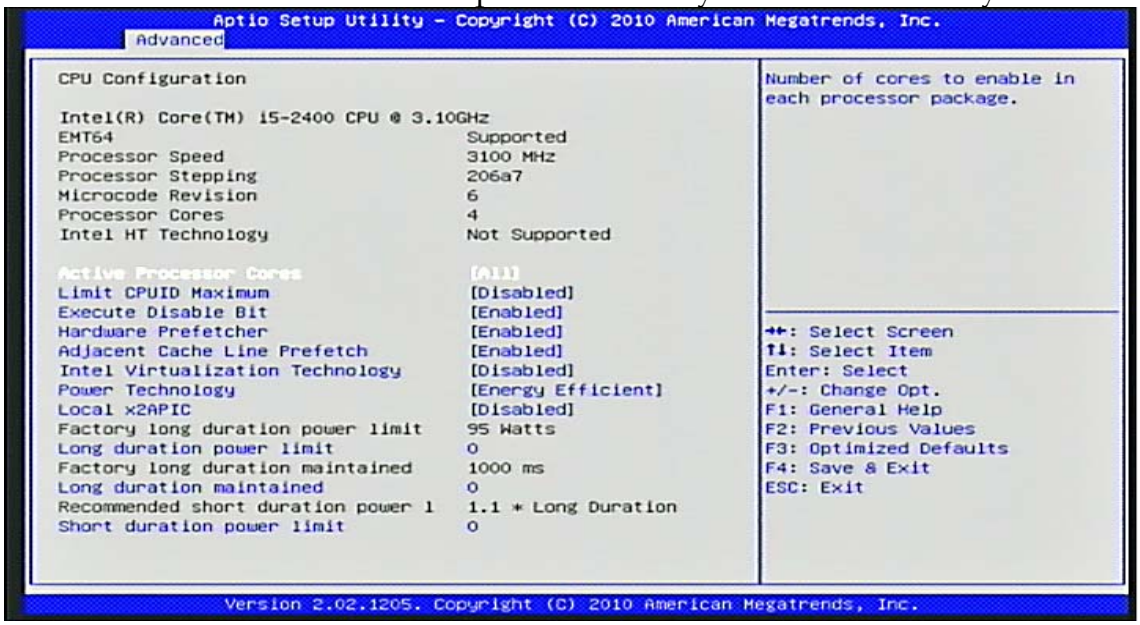
Wake up hour
Select 0-23 for example enter 3 for 3am and 15 for 3pm.
Choices: 0-23

Wake up minute
Choices: 0-59

Wake up second
Choices: 0-59

Wake system with Dynamic Time
Use this item to enable or disable system wake on alarm event. When set as [Enabled], system will wake on the current plus increased minute(s).
Choices: Disabled, Enabled

CPU Configuration
These items show the advanced specifications of your CPU. Read only.



Hyper-Threading
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Choices: Disabled, Enabled.

Active Processor Cores
Number of cores to Enabled in each processor package.
Choices: All, 1, 2, 3.

Limit CPUID Maximum
Disabled for Windows XP.
Choices: Disabled, Enabled.

Execute Disabled Bit
XP can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.).
Choices: Disabled, Enabled.

Hardware Prefetcher
To turn on/off the MLC streamer prefetcher.
Choices: Disabled, Enabled.

Adjacent Cache Line Prefetch
To turn on/off the prefetching of adjacent cache lines.
Choices: Disabled, Enabled.

Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Choices: Disabled, Enabled.

Power Technology
Enabled the power management features.
Choices: Disabled, Energy Efficient, Custom.

EIST
Enabled/Disabled Intel SpeedStep.
Choices: Disabled, Enabled.

P-STATE Coordination
Change P-STATE Coordination type.
Choices: HW_ALL, SW_ALL, SW_ANY.

CPU C3 Report
Enable/Disable CPU C3 (ACPI C2) report to OS.
Choices: Disabled, ACPI C-2, ACPI C-3.

Package C State limit
Choices: C0, C1, C6, C7, No Limit.

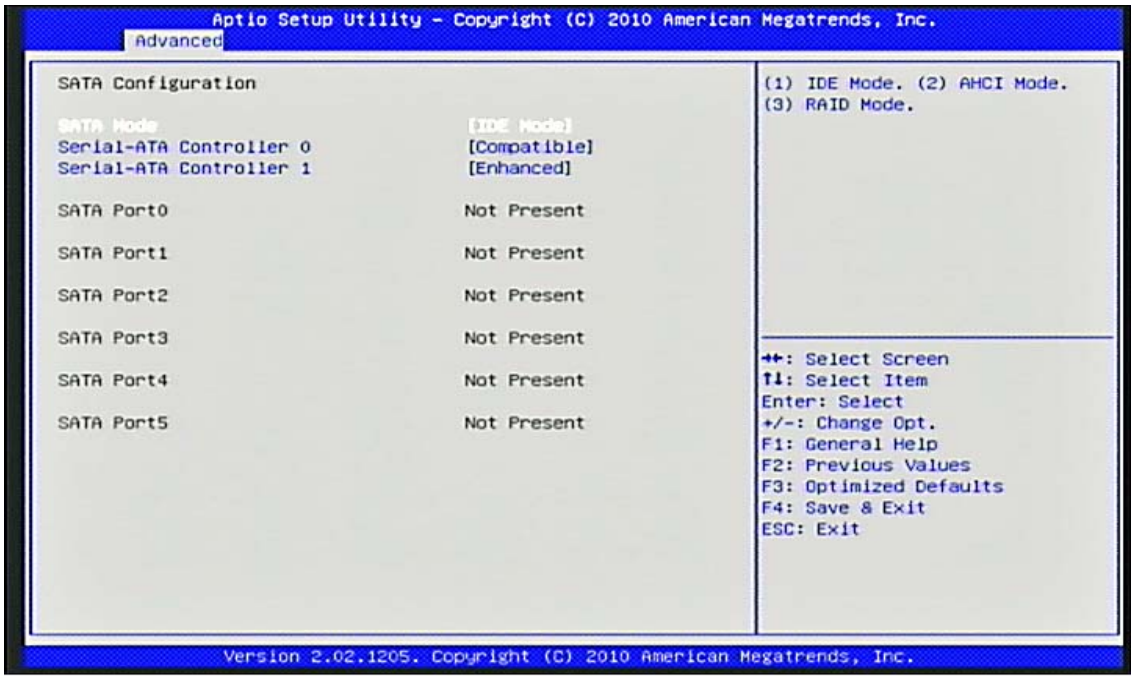
Local x2APIC
Enable Local x2APIC. Some OSes do not support this.

Long duration power limit
Long duration power limit in Watts.
Choices: 0-255

Long duration maintained
Time window which the long duration power is maintained.
Choices: 0-32000

Short duration power limit
Short duration power limit in Watts.
Choices: 0-255

SATA Configuration
SATA Devices Configuration.

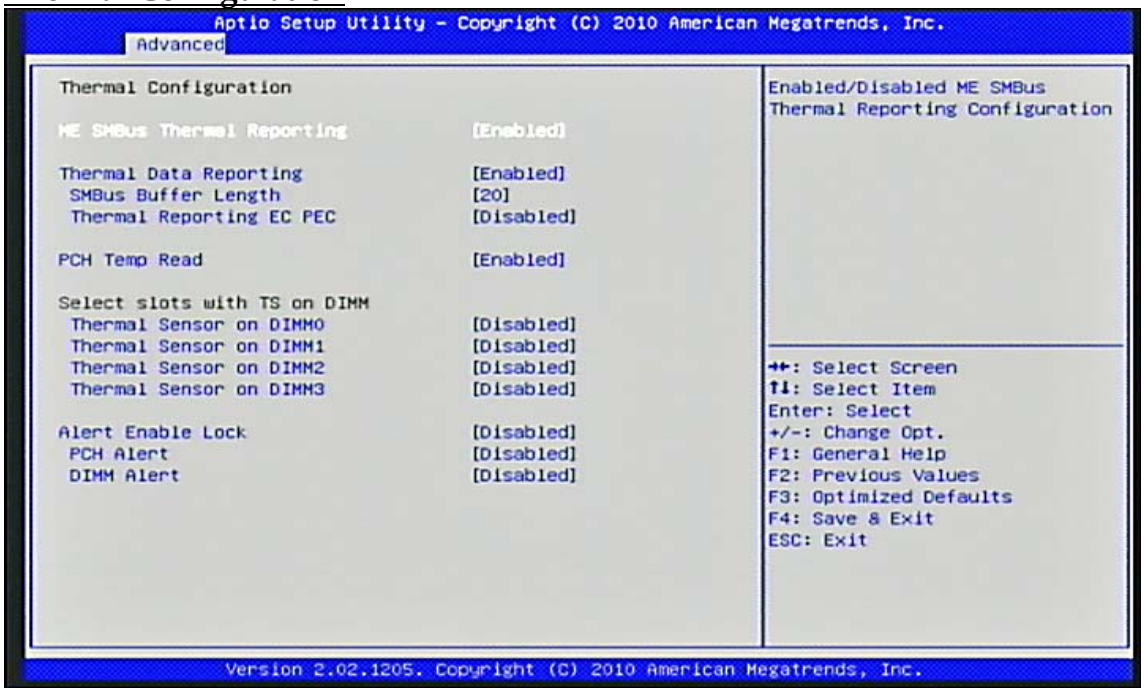


SATA Mode
Select IDE/AHCI Configuration.
Choices: Disable, IDE Mode, AHCI Mode.

Serial-ATA Controller 0
Enabled/Disabled Serial ATA Controller 0.
Choices: Disabled, Enhanced, Compatible.

Serial-ATA Controller 1
Enabled/Disabled Serial ATA Controller 1.
Choices: Disabled, Enhanced.

Thermal Configuration



ME SMBus Thermal Reporting
Enabled/Disabled ME SMBus Thermal Reporting Configuration.
Choices: Disabled, Enabled.

Thermal Data Reporting
Choices: Disabled, Enabled.

SMBus Buffer Length
SMBus Block Read message length for EC.
Choices: 1, 2, 5, 9, 10, 14, 20.

Thermal Reporting EC PEC
Enable Packet Error Checking (PEC) for SMBus Block Read.
Choices: Disabled, Enabled.

PCH Temp Read
PCH Temperature Read Enable.
Choices: Disabled, Enabled.

Thermal Sensor on DIMM0
Choices: Disabled, Enabled.

Thermal Sensor on DIMM1
Choices: Disabled, Enabled.

Thermal Sensor on DIMM2
Choices: Disabled, Enabled.

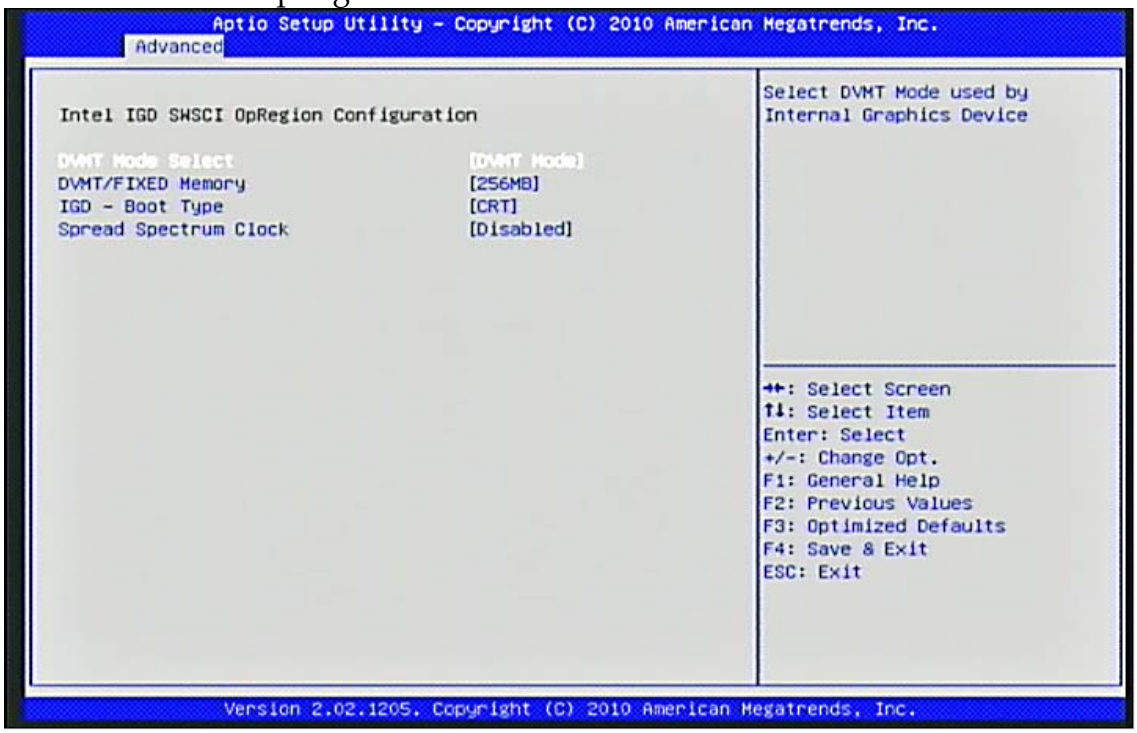
Thermal Sensor on DIMM3
Choices: Disabled, Enabled.

Alert Enable Lock
Lock all Alert Enable settings.
Choices: Disabled, Enabled.

PCH Alert
Choices: Disabled, Enabled.

DIMM Alert
Choices: Disabled, Enabled.

Intel IGD SWSCI Configuration
Intel IGD SWSCI OpRegion Function.



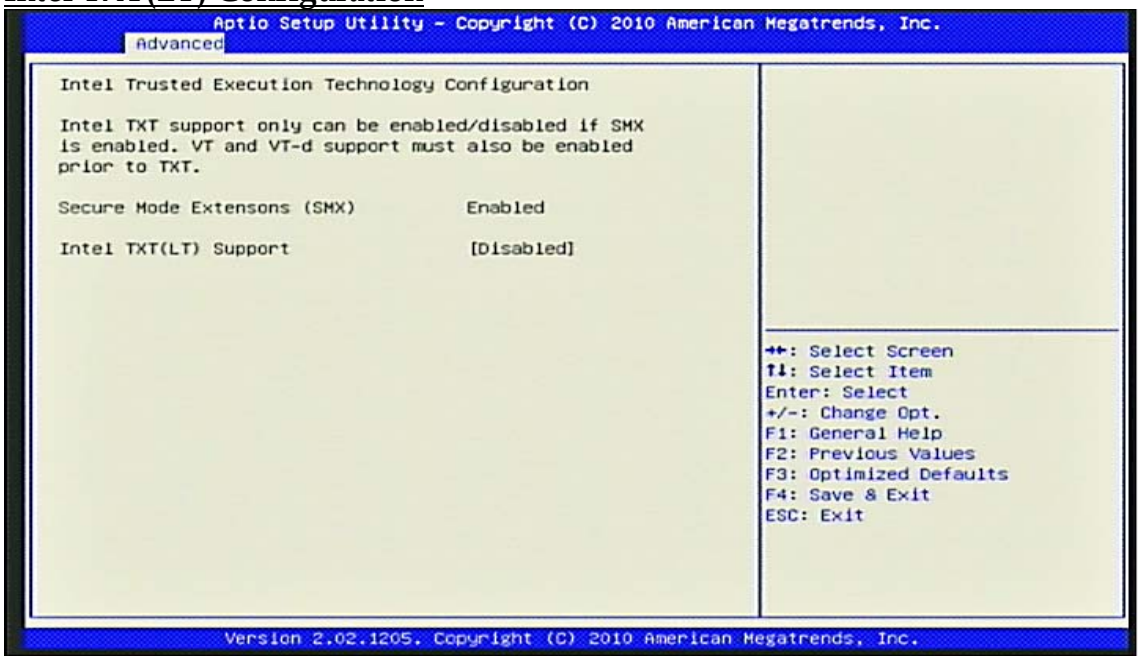
DVMT Mode
Select DVMT Mode used by Internal Graphic Device.
Choices: Fixed Mode, DVMT Mode.

DVMT/FIXED Memory
Select DVMT/FIXED Mode Memory size used by Internal Graphic Device.
Choices: 128MB, 256MB, Maximum.

IGD – Boot Type
Select the Video Device which will be activated during POST. This has no effect if external graphics present.
Choices: VBIOS Default, CRT, EFP, EFP2, EFP3, CRT + EFP.

Spread Spectrum Clock
Choices: Disabled, Enabled.

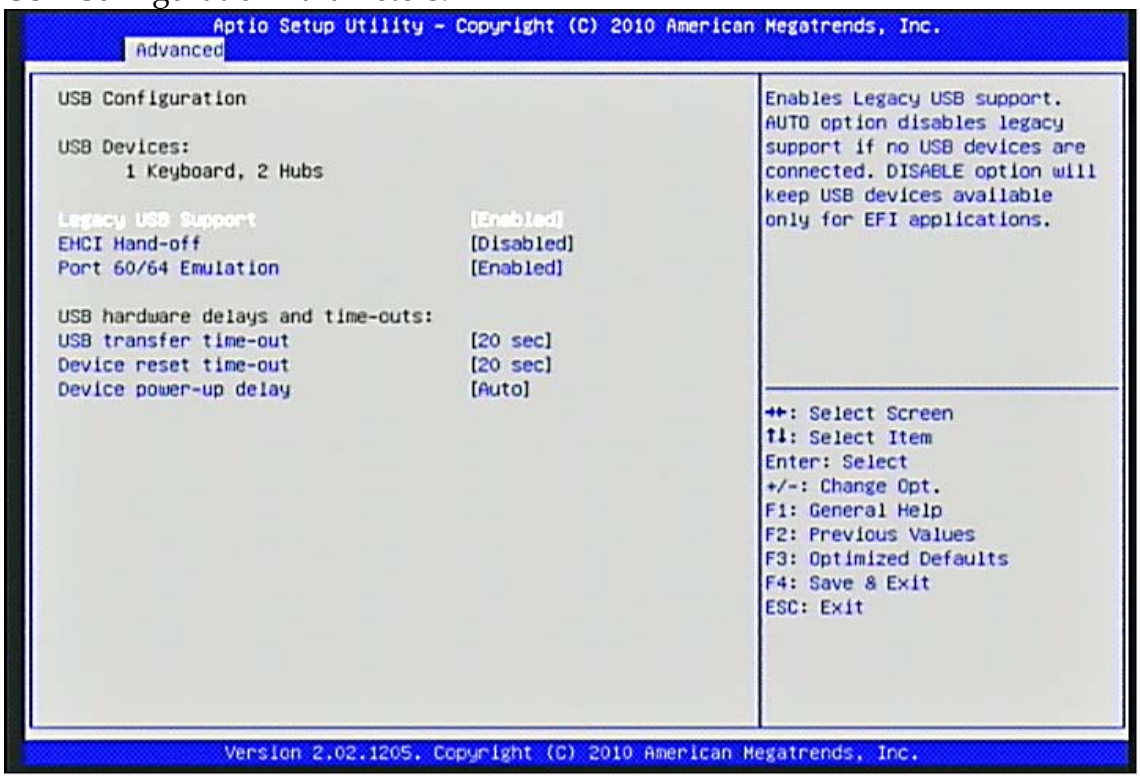
Intel TXT(LT) Configuration



Intel TXT(LT) Support
Enable/Disable Intel Trusted Execution Technology Support.

USB Configuration

USB Configuration Parameters.



Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
Choices: Disabled, Enabled, Auto.

EHCI Hand-Off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
Choices: Disabled, Enabled.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
Choices: Disabled, Enabled.

USB transfer time-out

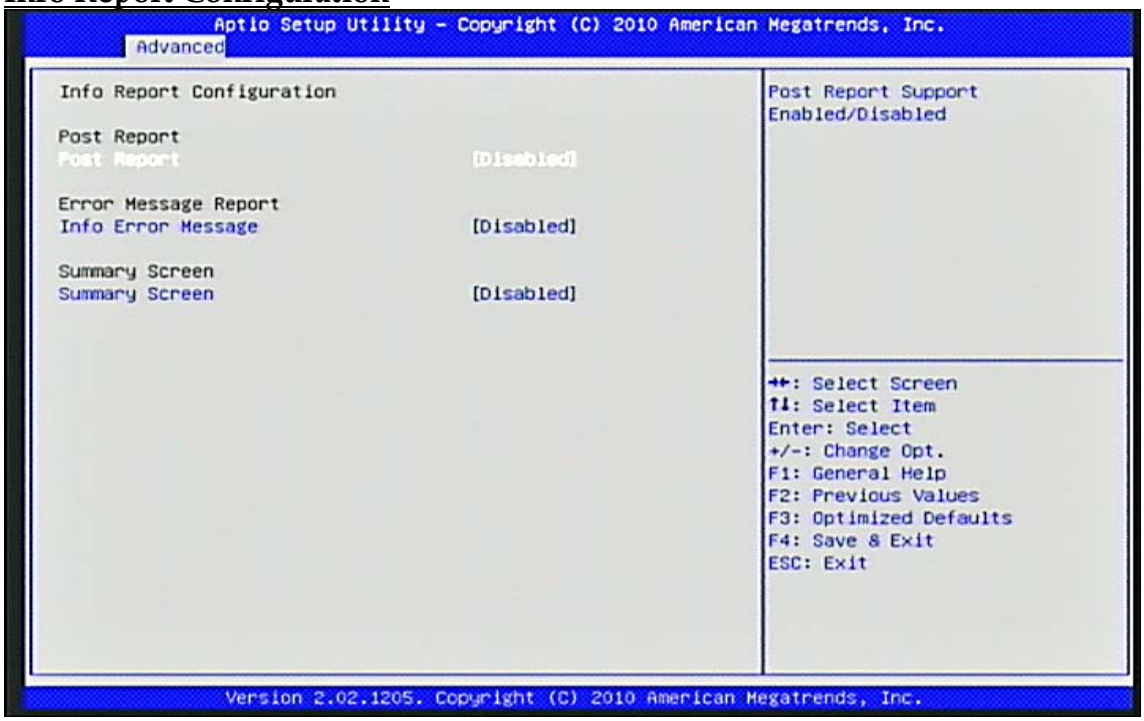
The Time-out value for Control, Bulk, and Interrupt transfers.
Choices: 1 sec, 5 sec, 10 sec, 20 sec.

Device Reset time-out

USB mass storage device Start Unit command time-out.
Choices: 10 sec, 20 sec, 30 sec, 40 sec.

Device Power-up delay
Maximum time the device will take before it properly reports itself to the Host Controller. 'AUTO' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.
Choices: Auto, Manual.

Info Report Configuration

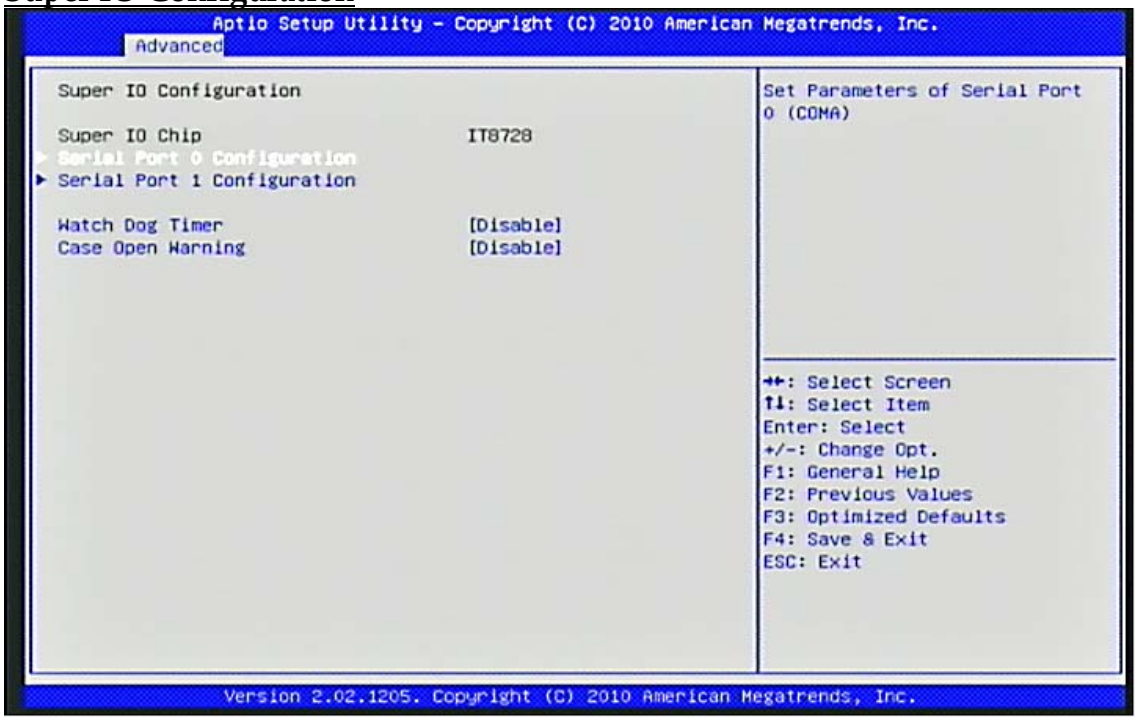


Post Report
Choices: Disabled, Enabled.

Info Error Message
Choices: Disabled, Enabled.

Summary Screen
Choices: Disabled, Enabled.

Super IO Configuration



Serial Port 0 Configuration

Set Parameters of Serial Port 0 (COMA)

Serial Port

Choices: Disabled, Enabled.

Change Settings

Select an optimal setting for Super IO Device.
Choices: Auto. IO=3F8h;
IRQ=4, O=3F8h;
IRQ=3,4,5,6,7,10,11,12, IO=2F8h;
IRQ=3,4,5,6,7,10,11,12,IO=3E8h;
IRQ=3,4,5,6,7,10,11,12,IO=2E8h;
RQ=3,4,5,6,7,10,11,12.

Serial Port 1 Configuration

Set Parameters of Serial Port 1 (COMB)

Serial Port

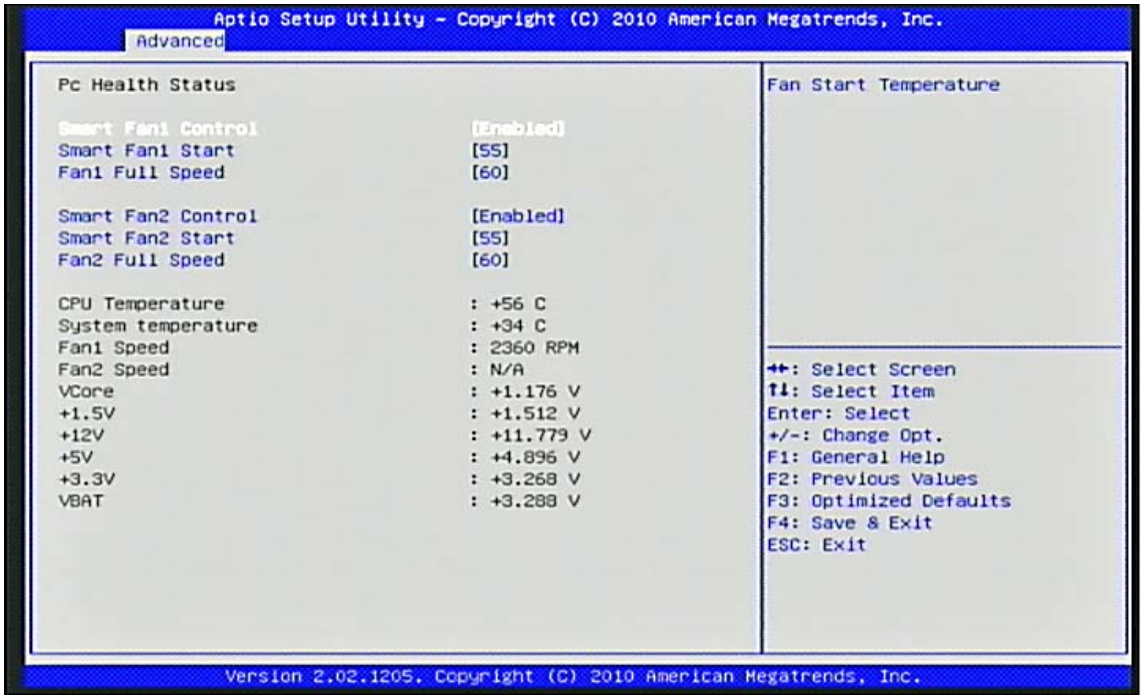
Choices: Disabled, Enabled.

Change Settings
Select an optimal setting for Super IO Device.
Choices: Auto. IO=2F8h;
IRQ=3, IO=3F8h;
IRQ=3,4,5,6,7,10,11,12, IO=2F8h;
IRQ=3,4,5,6,7,10,11,12, IO=3E8h;
IRQ=3,4,5,6,7,10,11,12, IO=2E8h;
IRQ=3,4,5,6,7,10,11,12.

Watchdog Timer
Set watchdog timer value.
Choices: Disabled, 10 Seconds, 20 Seconds, 30 Seconds, 40 Seconds, 50 Seconds, 60 Seconds.

Case Open Warning
If this function is set to "Enabled" and the case had been previously opened, the system will automatically display alert messages on the screen when you power on your computer. If this function is set to "Disabled", the system will not show alert messages when you power your computer even if the case is opened by others.
Choices: Disabled, Enabled.

H/W Monitor
Monitor hardware status.



Smart Fan1 Control
Smart Fan1 Function.
Choices: Disabled, Enabled.

Smart Fan1 Start
Smart Fan1 Start Temperature.
Choices: 25, 30, 35, 40, 45, 50, 55, 60, 65, 70.

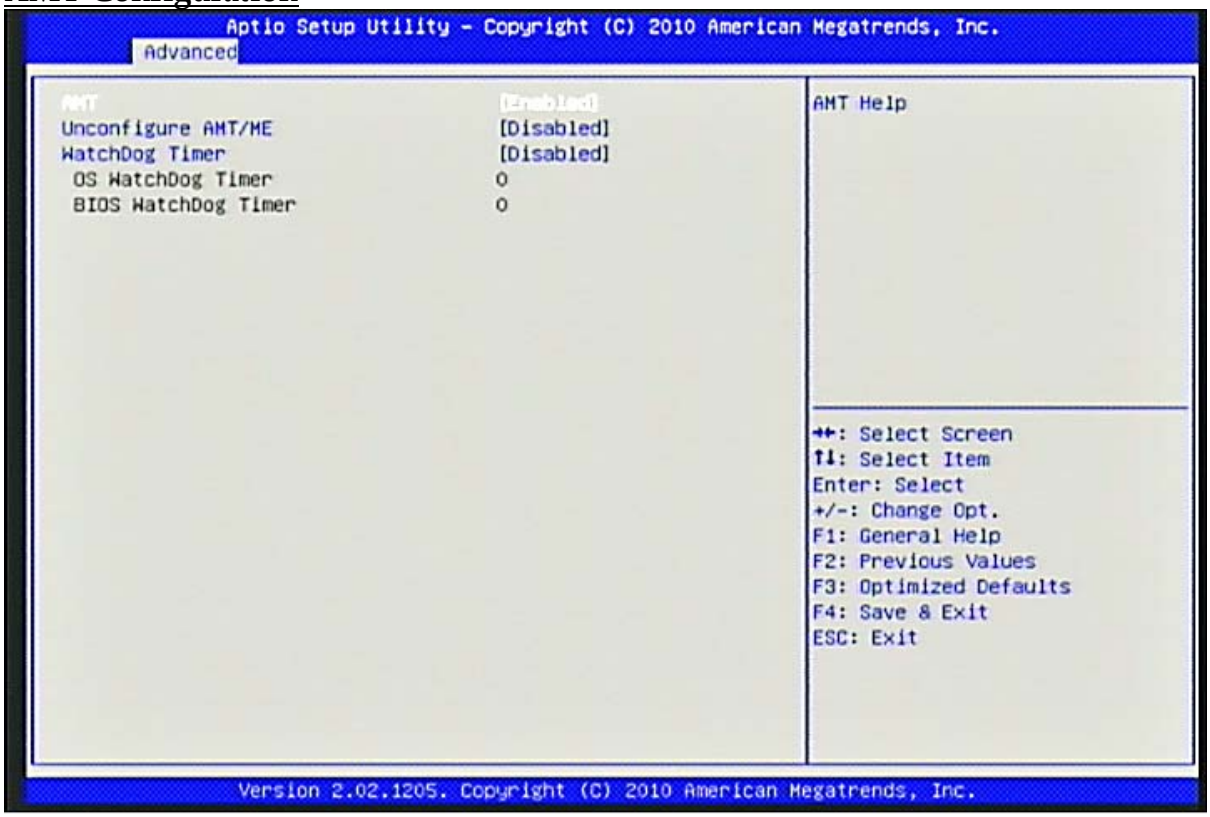
Fan1 Full Speed
Fan1 Full Speed Temperature.
Choices: 60, 65, 70, 75.

Smart Fan2 Control
Smart Fan2 Function.
Choices: Disabled, Enabled.

Smart Fan2 Start
Smart Fan2 Start Temperature.
Choices: 25, 30, 35, 40, 45, 50, 55, 60, 65, 70.

Fan2 Full Speed
Fan2 Full Speed Temperature.
Choices: 60, 65, 70, 75.

AMT Configuration

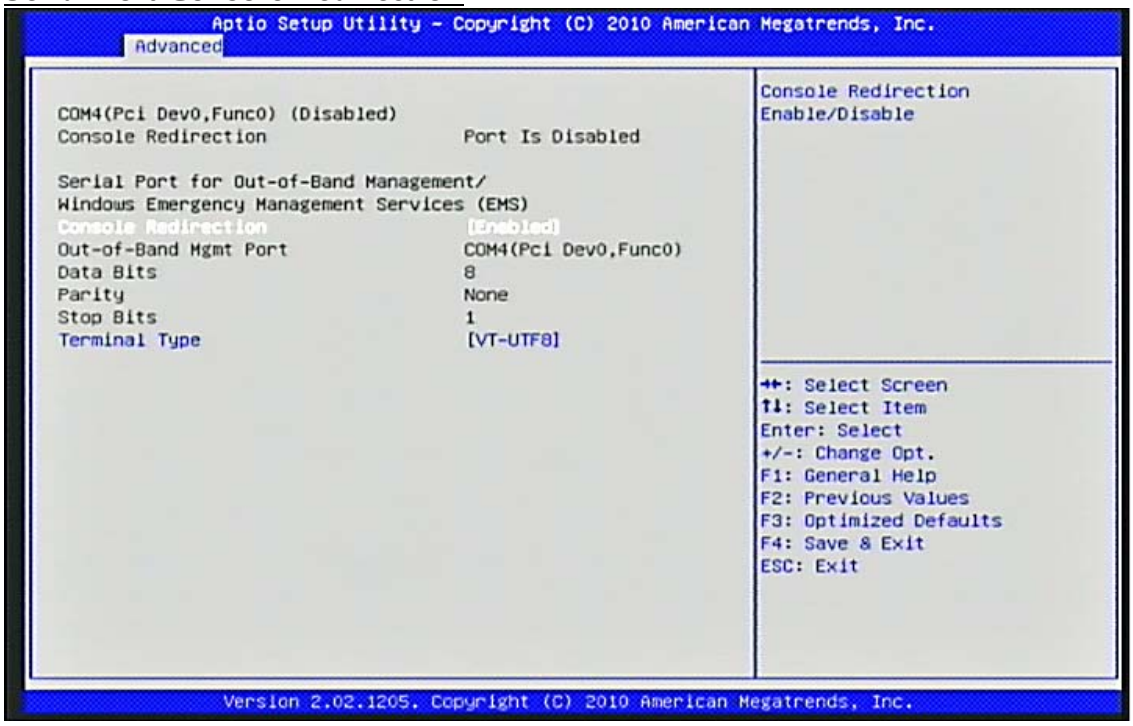


AMT
You can enable this item to support AMT (active management technology) function to follow up the procedure for access to AMI program screen.

Unconfigure AMT/ME
Use this item to unconfigure the AMT/ME settings.

WatchDog Timer
Enable/Disable WatchDog Timer.

Serial Port Console Redirection

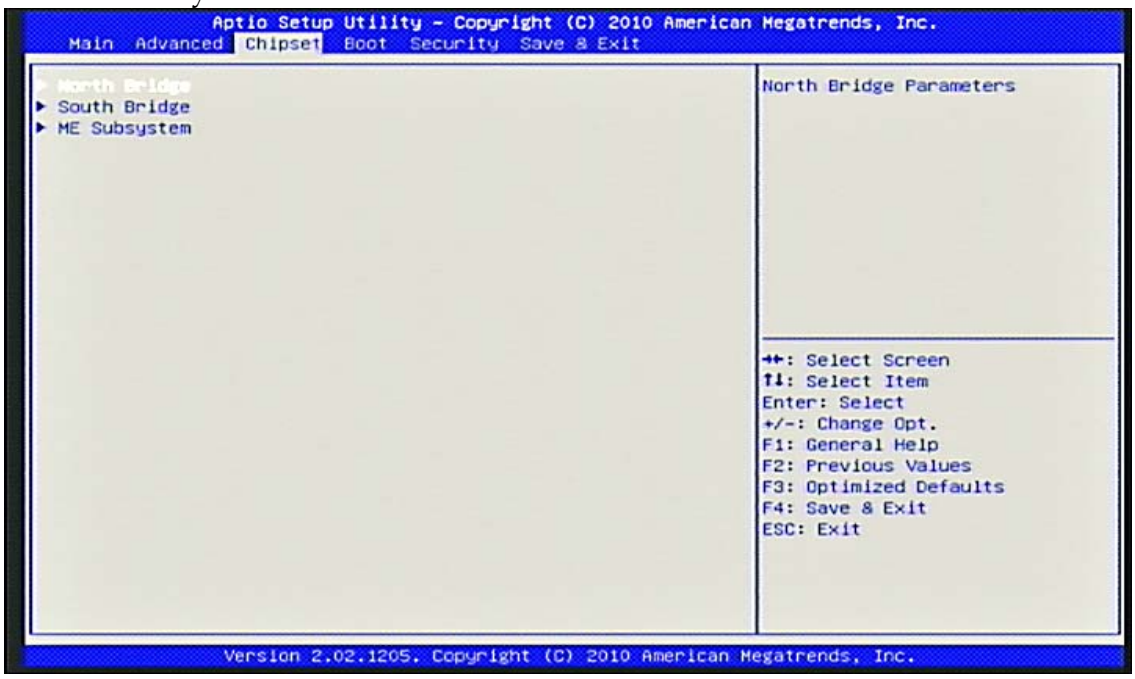


Console Redirection
Console Redirection Enable or Disable.

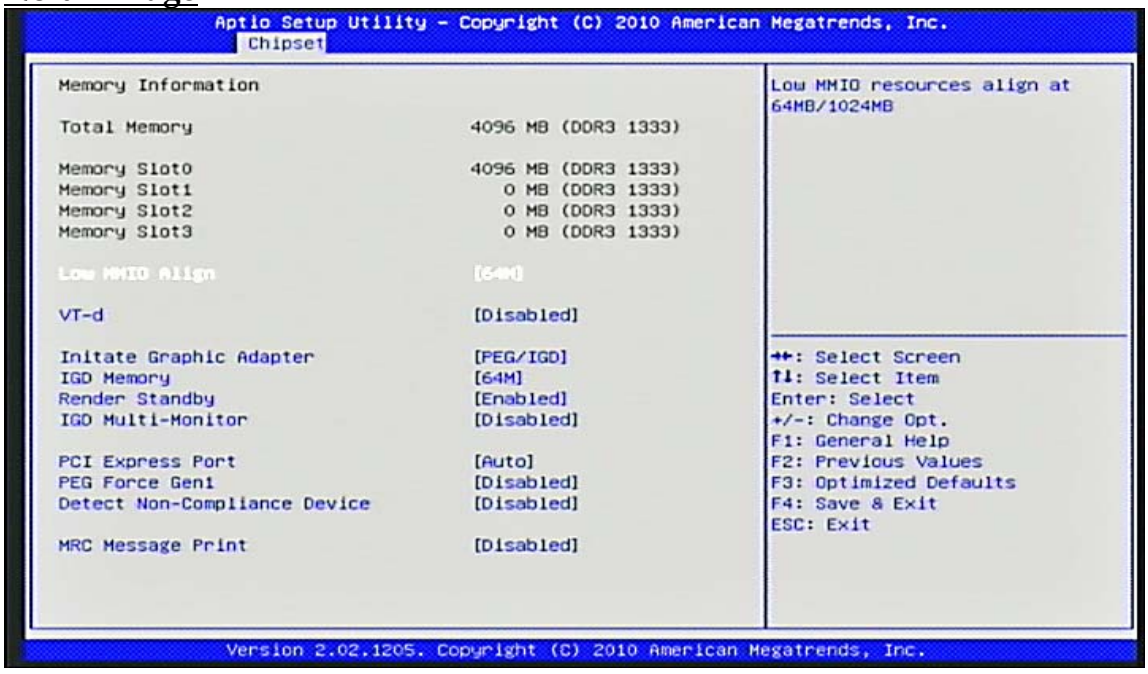
Terminal Type
VT-UTF8 is the preferred terminal type for out-of-road management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.
Choices: VT100, VT100+, VT-UTF8, ANSI.

4.4 Chipset

This menu controls the advanced features of the onboard North Bridge, South Bridge and ME Subsystem.



North Bridge



Low MMIO Align

Low MMIO resources align at 64MB/1024MB.
Choices: 64M, 1024M.

VT-d
Choices: Disabled, Enabled.

Intel Graphic Adapter
Select which graphics controller to use as the primary boot device.
Choices: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI.

IGD Memory
IGD Share Memory Size.
Choices: Disabled, 32M, 64M, 128M.

Render Standby
Enable/Disable Render Standby by Internal Graphics Device.
Choices: Disabled, Enabled.

IGD Multi-Monitor
Enable/Disable IGD Multi-Monitor by Internal Graphics Device.
Choices: Disabled, Enabled.

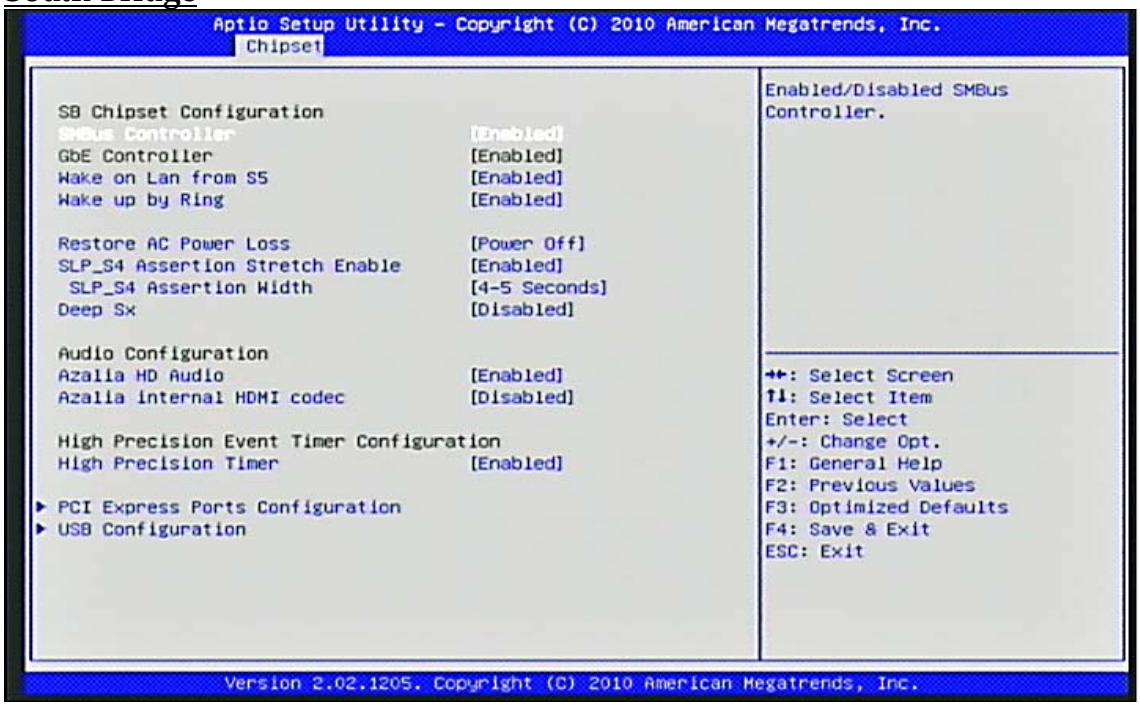
PCI Express Port
Choices: Disabled, Enabled, Auto.

PEG Force Gen1
Some non-graphic PCI-E devices may not follow PCI-E Specification and may incorrectly report their Gen capability or link width.
Choices: Disabled, Enabled.

Detect Non-Compliance Device
Detect Non-Compliance PCI Express Device in PEG.
Choices: Disabled, Enabled.

MRC Message Print
Print Memory initialize message.
Choices: Disabled, Enabled.

South Bridge



SMBus Controller
Choices: Disabled, Enabled.

Wake on Lan from S5
Enabled/Disabled GbE control PME in S5.
Choices: Disabled, Enabled.

Wake up by Ring
Choices: Disabled, Enabled.

Restore AC Power Loss
Specify what state to go to when power is re-applied after a power failure (G3 State).
Choices: Power Off, Power On, Last State.

SLP_S4 Assertion Stretch Enable
Enabled/Disabled SLP_S4# Assertion Stretch.
Choices: Disabled, Enabled.

SLP_S4 Assertion Stretch Width
Select a minimum assertion width of the SLP_S4# Assertion signal.
Choices: 1-2 Seconds, 2-3 Seconds, 3-4 Seconds, 4-5 Seconds.

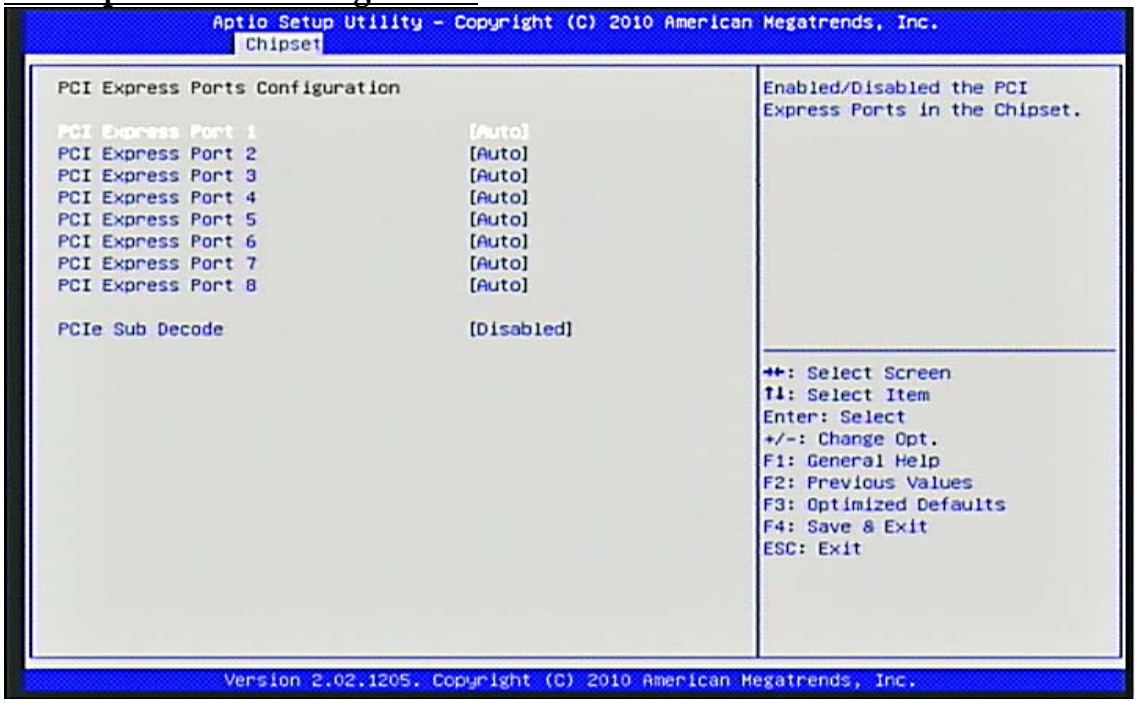
Deep Sx
Deep Sx configuration. Note: Mobile platforms support Deep S4/S5 in DC only and Desktop platforms support Deep S4/S5 in AC only.
Choices: Disabled, Enabled in S5 (Battery), Enabled in S5, Enabled in S4 and S5 (Battery), Enabled in S4 and S5.

Azalia HD Audio
Enabled/Disabled Azalia HD Audio.
Choices: Disabled, Enabled.

Azalia Intermal HDMI codec
Enabled/Disabled internal HDMI codec for Azalia.
Choices: Disabled, Enabled.

High Precision Timer
Enabled/Disabled the High Precision Event Timer.
Choices: Disabled, Enabled.

PCI Express Ports Configuration



PCI Express Port 1
Choices: Disabled, Enabled, Auto.

PCI Express Port 2
Choices: Disabled, Enabled, Auto.

PCI Express Port 3
Choices: Disabled, Enabled, Auto.

PCI Express Port 4
Choices: Disabled, Enabled, Auto.

PCI Express Port 5
Choices: Disabled, Enabled, Auto.

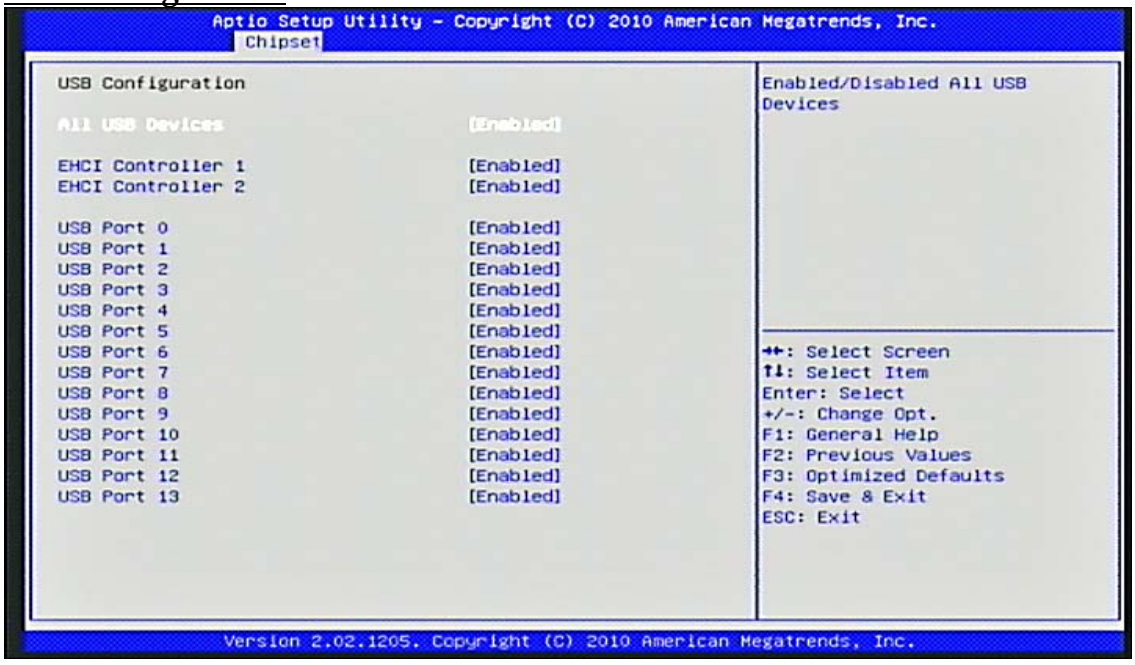
PCI Express Port 6
Choices: Disabled, Enabled, Auto.

PCI Express Port 7
Choices: Disabled, Enabled, Auto.

PCI Express Port 8
Choices: Disabled, Enabled, Auto.

PCIe Sub Decode
Enabled/Disabled PCIe Sub Decode Port. (This option is available when Subtractive Decode Agent Enable. (PCHTrap9 [14] = '1b')
Choices: Disabled, Enabled.

USB Configuration



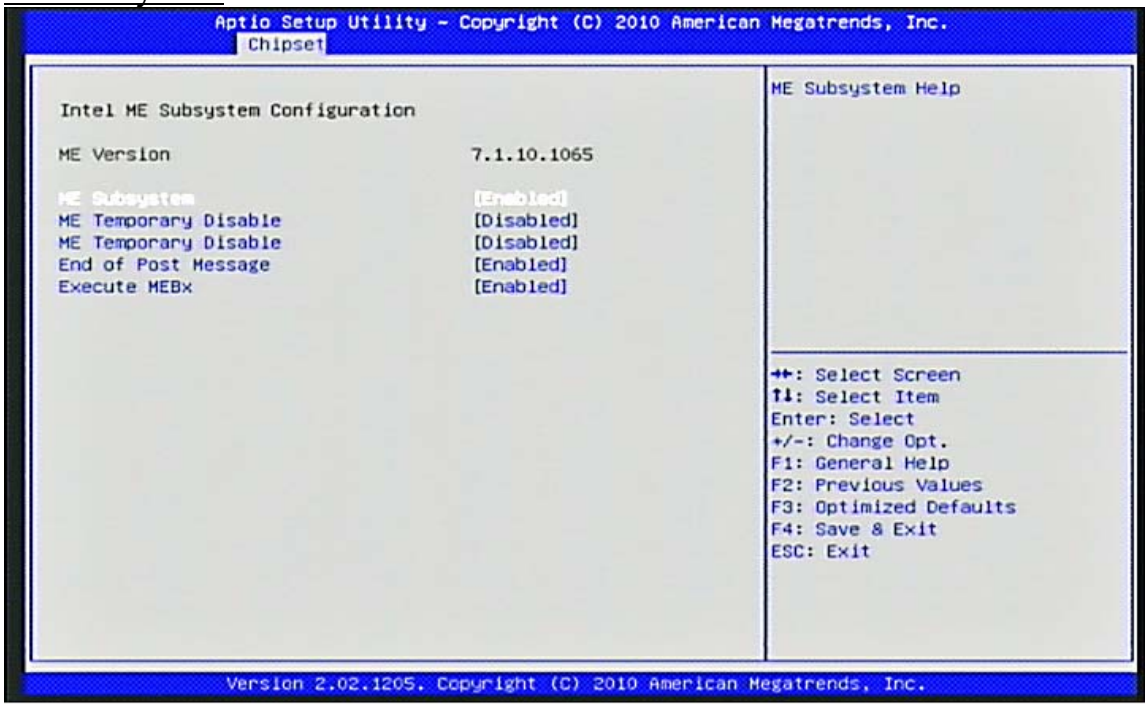
All USB Devices
Enabled/Disabled All USB Devices.
Choices: Disabled, Enabled.

EHCI Controller 1
Enabled/Disabled USB2.0 (EHCI) Support.
Choices: Disabled, Enabled.

EHCI Controller 2
Enabled/Disabled USB2.0 (EHCI) Support.
Choices: Disabled, Enabled.

USB Port 0-13
Enabled/Disabled USB Port 0-13
Choices: Disabled, Enabled.

ME Subsystem



ME Subsystem
Use this item to enable or disable ME subsystem.

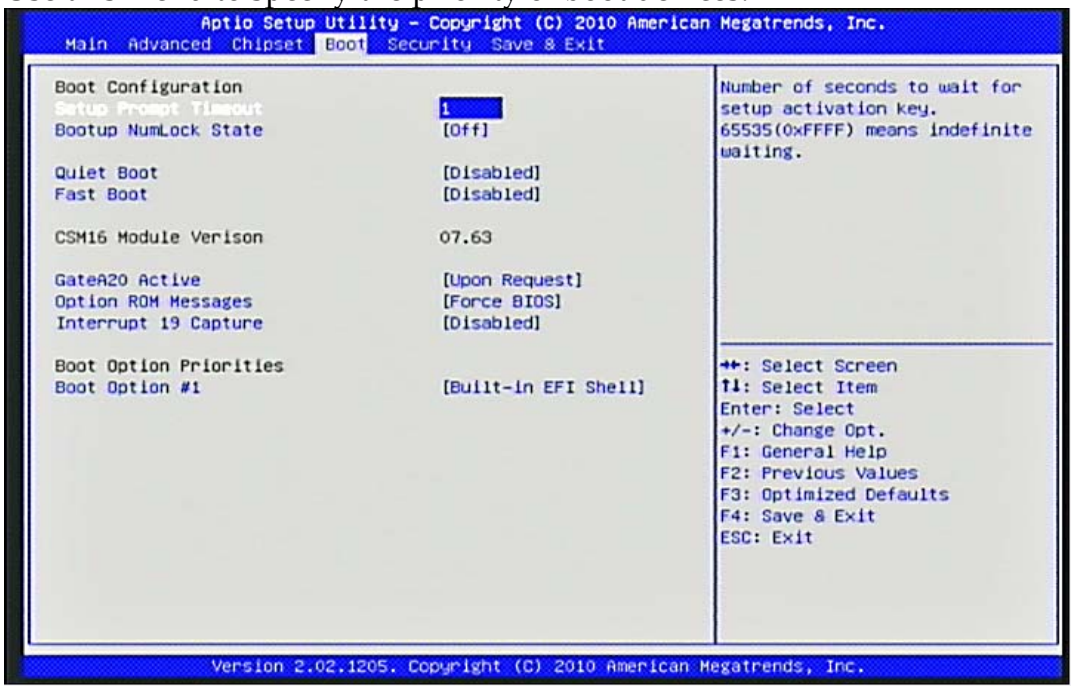
ME Temporary Disable
Use this item to enable or disable ME temporary disable help.

End of Post Message
Choices: Disabled, Enabled.

Execute MEBx
Choices: Disabled, Enabled.

4.5 Boots

Use this menu to specify the priority of boot devices.



Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Choices: 1-65535.

Bootup Num-Lock State

Select the keyboard Numlock state.
Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.
Choices: On, Off.

Quiet Boot

Enables or disables Quiet Boot option.
This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages. When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disabled this BIOS feature for a faster boot-up time.
Choices: Disabled, Enabled.

Fast Boot
Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Choices: Disabled, Enabled.

GateA20 Active
UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Choices: Upon Request, Always.

Option ROM Messages
Set Display mode for Option ROM.
This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.
Choices: Force BIOS, Keep Current.

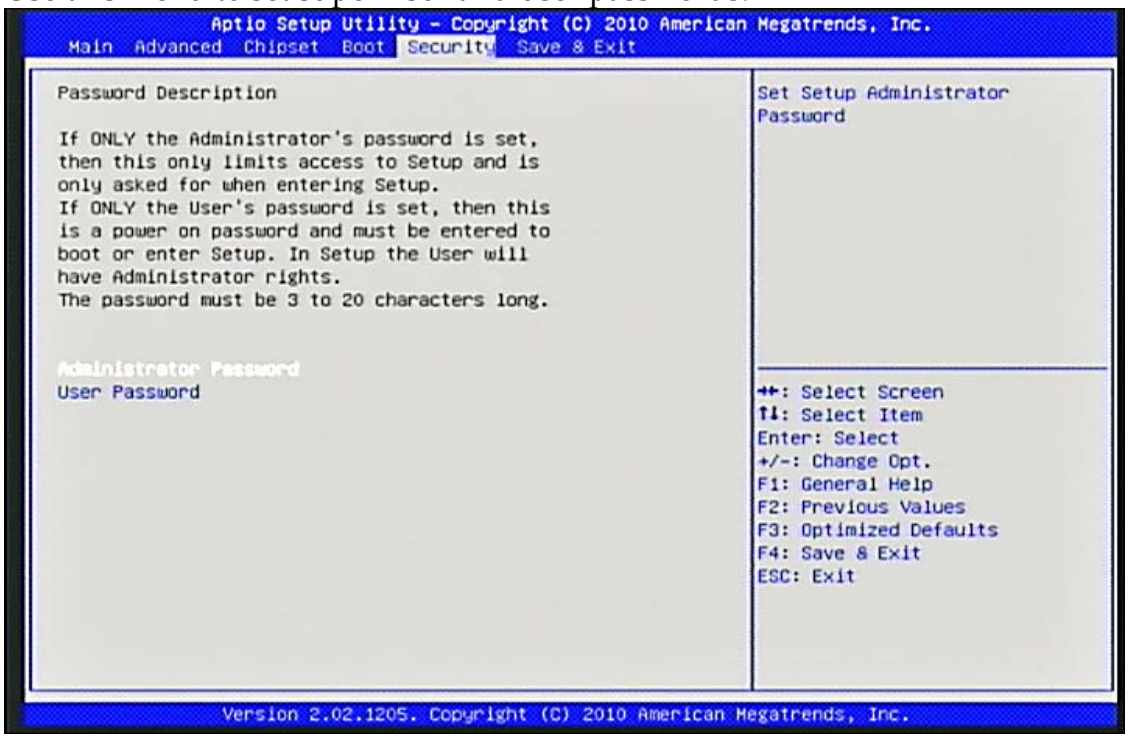
Interrupt 19 Capture
Enabled: Allows Option ROMs to trap Int 19.
Interrupt 19 is the software interrupt that handles the boot disk function. When Enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain access to the host adaptor's ROM setup utility, if one is available.

When Disabled, the ROM BIOS of these host adaptors will not be able to "capture" Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.
Choices: Disabled, Enabled.

Boot Option #1
Sets the system boot order.
Choices: Built-in EFI Shell, other bootable devices, Disabled.

4.6 Security

Use this menu to set supervisor and user passwords.

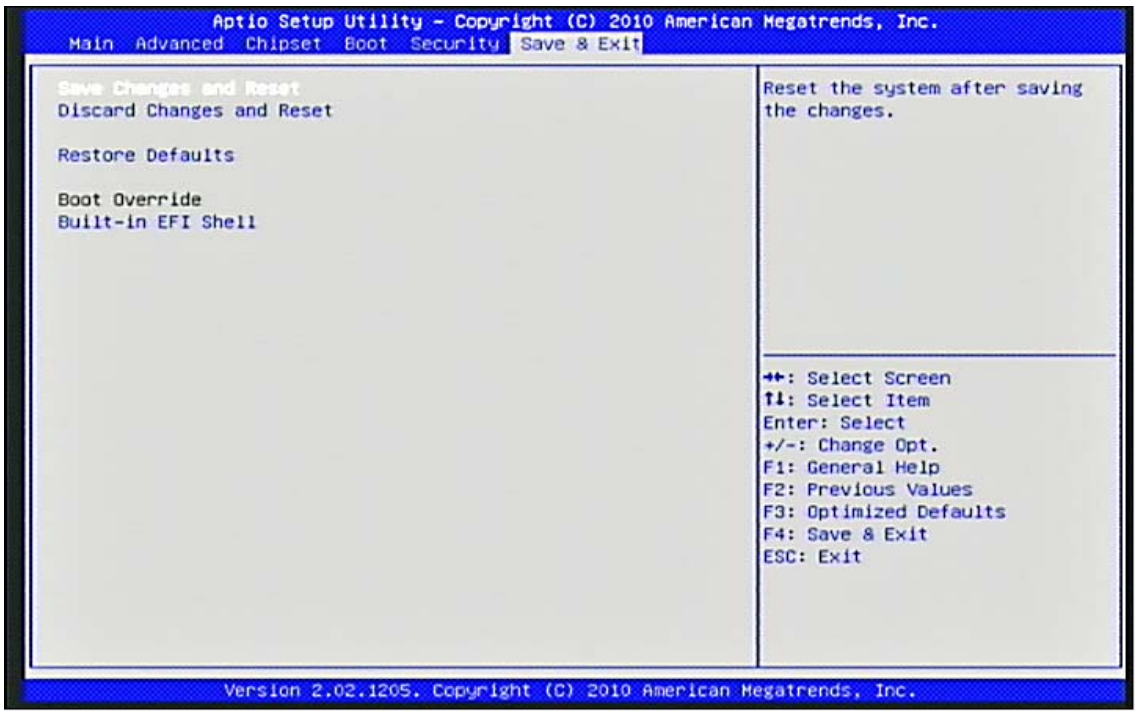


Administrator Password
Set Setup Administrator Password.

User Password
Set User Password.

4.7 Save & Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.



Save Changes and Reset
Reset the system after saving the changes.
Pressing <Enter> on this item asks for confirmation: Save configuration and reset.

Discard Changes and Reset
Reset system setup without saving any changes.

Restore Defaults
Restore/Load Default values for all the setup options.

Built-in EFI Shell
Boot into the initial shell environment, it can debug and dump the PCI Resource or jump to next bootable device. If it doesn't have boot device, it will return to BIOS setup menu. If you want to know the shell command, you can visit the Intel official hyperlink as below.

http://software.intel.com/en-us/articles/uefi-shell/#Internal_EFI_Shell_Commands

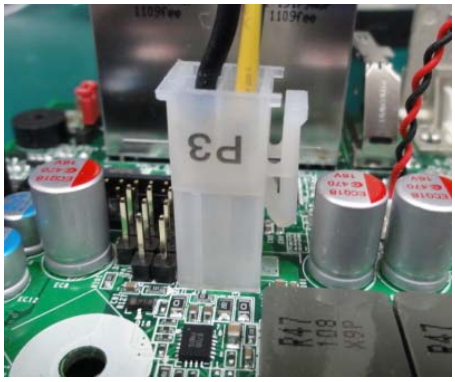
Chapter 5
Troubleshooting

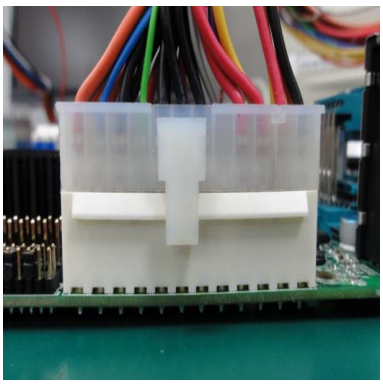
This chapter provides a few useful tips to quickly get WADE-8011/WADE-8012 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS

5.1 Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, WADE-8011/WADE-8012 supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J10 (4 pins CPU +12V main power connector) & J13 (24 pins ATX Power Connector) Figure.





Serial ATA Hard Disk Setting for IDE/AHCI

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total six connectors, J18, J19, J20, J21, J22 and J23. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to operate IDE and AHCI application for system, please follow up setting guide in BIOS programming (Table 5-1); Furthermore, you can consult chapter 4.3 Advanced "SATA Configuration" part of the" SATA Mode".

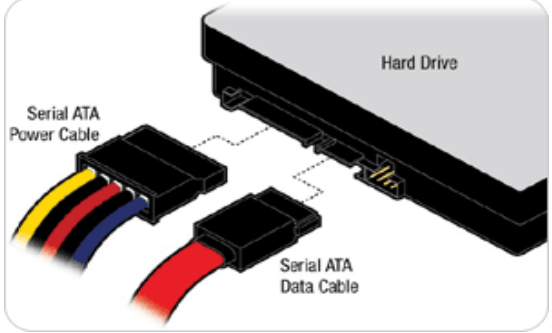


Table. 5-1 SATA Mode setting guide

System BIOS Main Menu

- Advanced
  - SATA Configuration …….…… [Press enter]
    - SATA Mode…… [IDE Mode/AHCI Mode]

The J22 and J23 (Gray connector) SATA connector can support SATA 3.0 hard disk.

5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. 240-pin DDR3 Memory, keyboard, mouse, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8011/WADE-8012, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup

menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Restore Defaults**", press "**Enter**" and select "**Yes**" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Improper Disable Operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the Serial Port1/ Serial Port 2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable Serial Port1 to release IRQ #4
Disable Serial Port2 to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Timer
IRQ #1	Keyboard Event
IRQ #2	Usable IRQ
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Usable IRQ
IRQ #6	Diskette Event
IRQ #7	Usable IRQ
IRQ #8	Real-Time Clock
IRQ #9	Usable IRQ
IRQ #10	Usable IRQ
IRQ #11	Usable IRQ
IRQ #12	IBM Mouse Event
IRQ #13	Coprocessor Error
IRQ #14	Hard Disk Event
IRQ #15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 Q&A

Symptom: SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Information & Support

Question: I forget my password of system BIOS, what am I supposed to do?

Answer: You can simply short 2-3 pins on JP1 to clean your password.

Question: How to update the BIOS file of the WADE-8011/WADE-8012?

Answer: 1. Please visit web site of the Portwell download center as below hyperlink and register an account.
http://www.portwell.com.tw/support/newmember.php

2. Input your User name and password to log in the download center.
3.Select the "Search download" to input the keyword "WADE-8011/8012".
4. Find the "BIOS "page to download the ROM file and flash utility.
5. Execute the zip file to root of the bootable USB pen drive.
6. Insert your bootable USB pen drive in WADE-8011/8012 board and power-on.
7. Input the "AFUDOS XXXXX.ROM -p -b -n" to start to update BIOS. ("XXXXX" is the file name of the ROM file.)
8. Switch "Off" the Power Supply when you finished the update process.
9. To short the JP1 jumper from 1-2 short to 2-3 short 5 seconds then set back to 1-2 short. (Clear CMOS)
10. Switch "ON" the Power Supply then press the "del" key to BIOS to load "Restore Defaults" and then select "Save Changes and Exit" option.

Note:

Please visit our technical web site at
http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or you can also send mail to our sales, they will be very delighted to forward them to us.System Memory Address Map

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9BFF	562K	【Available】
= Conventional memory ends at 624K =		
9C00-9D3F	5K	Extended Bios Area
9D40-9FFF	11K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CD7F	54K	Video ROM
CD80-EFFF	138K	Unused
F000-FFF	64K	System ROM
HMA	64K	First 64k Extended

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Interrupt Request Lines IRQ		
IRQ#	***Current Use***	***Default Use***
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	【Unassigned】	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	【Unassigned】	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	【Unassigned】	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	【Unassigned】	Usable IRQ
IRQ 10	【Unassigned】	Usable IRQ
IRQ 11	Video ROM	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event

IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	【Unassigned】	Usable IRQ